University of Alberta

Active Living Strategies as an Adjunct to Nutrition Counseling

By

Mark Alan Spidel

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science

In

Nutrition and Metabolism

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Abstract

The inter-relationships among healthy eating, active living and chronic disease prevention have become more evident. Dietitians are in an ideal position to promote healthy eating and active living messages. The purpose of this study was to identify (1) the perceived role and needs of dietitians in promoting active living by conducting focus groups, and (2) to develop a questionnaire to assess knowledge, attitudes, and self-efficacy of dietitians in promoting active living. It was identified in the focus groups that dietitians should take a proactive role in promoting active living and should increase their collaboration with physical activity professionals. However, they were concerned about their lack of knowledge in exercise science, public perception, and the relative importance of active living to their practice. They identified the need for further education, resources, and skill development to effectively promote active living. A questionnaire was developed to assess knowledge, attitudes, and self-efficacy of dietitians pre- and post-attendance at an educational workshop.

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Abbreviations

ACSM	American College of Sports Medicine
ADA	American Dietetic Association
AHA	American Heart Association
BMI	Body mass index
CD	Content domain
CFLRI	Canadian Fitness and Lifestyle Research Institute
CVD	Cardiovascular disease
DXA	Dual energy x-ray absorptometry
HDL	High density lipoprotein
LDL	Low density lipoprotein
NHANES	National Health and Nutrition Examination Survey
PBC	Perceived behavioral control
RMR	Resting metabolic rate
SCT	Social Cognitive Theory
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
VLDL	Very low density lipoprotein

Chapter One: Introduction

1.1 Rationale

A strategy to achieve optimal health and lower risk of chronic disease is through promotion of healthy eating and active living (American Dietetic Association, 1998). Together, they are important in treatment and prevention of many chronic diseases including type 2 diabetes, obesity, cardiovascular disease (CVD), cancer, and osteoporosis (American Dietetic Association, 1998; Blair, et al., 1996; Frankish, Milligan & Reid, 1998; Grimm, 1999; Hill, 1999; and Wei, Schwertner & Blair, 2000), which are major health concerns for Canadians. Regular physical activity can help to normalize metabolic risk factors for diseases such as CVD and type 2 diabetes. Beyond the physiological benefits of physical activity, it can improve mental and emotional health by decreasing anxiety and depression and improving body image and self-esteem (Fox, 1999).

The level of inactivity among Canadian youth and adults is high. Data from the Canadian Fitness and Lifestyle Research Institute's *2000 Physical Activity Monitor* estimates that 61% of Canadian adults are not physically active enough to achieve optimal health (CFLRI, 2000). More women (67%) are considered inactive than men (54%). The inactivity levels of children are also high, with girls (62%) more inactive than boys (52%) (CFLRI, 2000). Physical inactivity puts individuals at an increased risk of chronic disease, and the prevalence of obesity and type 2 diabetes is increasing in Canada (Statistics

Canada, 1999). Research supports the positive relationship between inactivity and chronic disease. Physical inactivity is now considered to be an independent risk factor for cardiovascular morbidity and all-cause mortality, as is smoking and hypertension (Frankish et al, 1998; Pate et al, 1995).

Health professionals collectively can be united in promoting healthy lifestyles and preventing illness by combining the healthy eating and active living messages. Support for combining the two messages exists. In a report by Dietitians of Canada, it is stated that "population health promotion strategies that promote healthy eating and active living help to reduce the incidence of chronic illnesses" (Dietitians of Canada, 2001, 11). The American Dietetic Association (1998) states that "optimal nutrition and physical activity can promote health and reduce the risk of chronic disease. Qualified dietetics professionals should play an integral role in health promotion and disease prevention programs" (page 205). Furthermore, *Canada's Guidelines to Healthy Eating* includes one guideline which states, "achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating" (Health Canada, 1991). These positions support the need for integrating active living into nutrition counseling to impact health. Physical activity professionals also recognize the importance of combining the two messages. A position statement by The American College of Sports Medicine (ACSM) (2001) suggests that a number of intervention strategies can be used to manage weight, including changes in energy intake, energy composition, and increased energy expenditure through physical activity.

Dietitians are highly trained professionals in the area of healthy eating and the treatment and prevention of chronic disease through nutrition. However, they recognize the importance of physical activity in these diseases. Dietitians are in an ideal position to promote active living by combining healthy eating and active living messages. Dietitians of Canada (2001) state that "dietitians utilize health promotion, disease prevention and treatment strategies that support communities and individuals to make healthy eating and active living choices" (page 3). Dietitians are effective counselors of health-related behavior change. The skills needed to assist people in adopting healthy eating behaviors are similar to those needed in adopting active living behaviors. Dietitians are effective facilitators of "behavior change as part of an integrated approach to promoting health and preventing chronic disease" (ADA, 1998, 207). However, dietitians may not have the knowledge and/or skills to effectively monitor and assess active living.

To support dietitians in promoting the message of active living with their clients, it may be necessary to increase their self-efficacy in counseling and promoting physical activity. According to social cognitive theory, increasing self-efficacy is necessary for behavior change to occur (Bandura, 1997). In this situation, the behavior change being investigated is to have dietitians promote active living. Bandura (1997) explains that "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, 2-3).

It was speculated that providing dietitians with knowledge, skill development, and resources about active living would increase their efficacy to effectively counsel their clients on active living strategies. One way to accomplish this was through an educational workshop. A study by Noel and Ames (1989) investigated dietitians' attitudes, knowledge, and problem-solving approach to aging. They concluded that continuing education on aging had a positive influence on dietitians' attitudes and knowledge about income and health issues related to the elderly (Noel and Ames, 1989). Eckstrom et al (1999) investigated changing physician practices related to physical activity by conducting education workshops to improve self-efficacy and counseling behaviors. They concluded that educational interventions were effective in improving self-efficacy for physical activity counseling (Eckstrom et al, 1999). To our knowledge, there are no published reports of investigations of educational strategies to improve the efficacy of dietitians in promoting active living.

1.2 Purpose

The purpose of this thesis was as follows:

The overall purpose of the project was to conduct focus groups to identify (1) the perceived role of dietitians in promoting active living and (2) the needs of dietitians in promoting active living. The results of the focus groups were used to develop a 2-day training workshop. Knowledge, attitudes, and self-efficacy

regarding active living were assessed using questionnaires pre- and one month post-attendance at the workshop.

1.3 Objectives

The primary objectives of this thesis were as follows:

Objective 1. To conduct focus groups throughout Alberta to identify dietitians' perceptions towards incorporating active living into nutrition counseling (**Chapter 3**).

Objective 2. To develop a questionnaire to assess knowledge, attitudes, and self-efficacy of dietitians in promoting active living (**Chapter 4**).

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Chapter Two: Review of the Literature

2.1 Introduction

Healthy eating and active living are lifestyle determinants of optimal health and are significant modifiable risk factors for prevention of disease (Sjostrom, 2001). In combination, they can lower the risk of chronic illness, including cardiovascular disease (CVD), obesity, diabetes, osteoporosis, and cancer (American Dietetic Association, 1998; Blair, et al., 1996; Frankish, Milligan & Reid, 1998; Grimm, 1999; Hill et al, 2001; and Wei, Schwertner & Blair, 2000). In Canada, Katzmarzyk et al (2000) estimated that over 21,000 (10.3%) deaths in 1995 could have been prevented by living a healthy lifestyle. Deaths from CVD (35.8%), stroke (19.9%), colon cancer (19.9%), breast cancer (11.0%), and type 2 diabetes (19.9%) were attributable to physical inactivity (Katzmarzyk et al, 2000). McGinnis and Foege (1993) have estimated that 300,000 preventable deaths/year in the United States are a result of a combination of unhealthy lifestyle behaviors (poor dietary intakes and inactivity), second only to smoking. Unhealthy lifestyles are a result of complex societal changes that have occurred over recent decades (Hill et al, 2001).

Many of the chronic diseases, including CVD, diabetes, obesity, osteoporosis, and hypertension have similar elements to them: they are chronic rather than acute, they develop over a lifetime, in most cases they are 'managed' rather than 'cured', and they have substantial impacts on quality of life, morbidity,

and mortality (Barr, 2001). In the treatment and prevention of such conditions, dietary and physical activity interventions are equally important.

Targeting problems associated with dietary and physical activity behavior is complex as there is little agreement among public health authorities and medical experts as to effective solutions (Hill et al, 2001; Kaplan, Sallis & Patterson, 1993, 59). However, prevention is believed to be the key to controlling the increased prevalence of chronic disease (American Dietetic Association, 1998; Blair et al, 1996; Hill et al, 2001). "Prevention measures, such as nutrition interventions that also encourage physical activity, can help prevent or halt progression of full-blown chronic disease and thus decrease chronic disease disability" (ADA, 1998, 206). Major health organizations are advocating the promotion of healthy eating and regular physical activity as determinants in lowering the risk of chronic illness. Dietitians of Canada (2001) support "population health promotion strategies that promote healthy eating and active living [to help] reduce the incidence of chronic illnesses" (page 11), and in a position statement by the American Dietetic Association (1998), it states that "optimal nutrition and physical activity can promote health and reduce the risk of chronic disease" (page 205). In the 2000 *Nutrition and Your Health: Dietary Guidelines for Americans*, under the broad message, Aim for Fitness, is the guideline of "Be physically active each day" (U.S. Department of Health and Human Services, 2000). The changes to the guidelines were recommended to recognize the important relationship between nutrition and physical activity and

the extensive health benefits physical activity offers (Troiano, Macera & Ballard-Barbash, 2001).

2.2 The active living concept

Active living is one determinant of a healthy lifestyle. It is defined by Health Canada as "a way of life in which physical activity is valued and integrated into daily life. Active living moves away from traditional prescriptive exercise programs that either turned people off, or encouraged them to overdo" (Health Canada, 1998). Examples of ways to incorporate active living into daily life include taking the dog for a walk, taking the stairs instead of the elevator, and parking your car farther away from the grocery store.

Active living is a complex and comprehensive concept that takes a non-traditional approach to exercise (Bercovitz, 2000; Frankish et al, 1998; Makosky, 1994). It recognizes the physiological aspects and benefits of physical activity, but it also appreciates the social, mental, emotional and spiritual aspects and benefits of physical activity by linking the mind, body and spirit and interactions with the environment (Bercovitz, 2000; Frankish et al, 1998; Makosky, 1994). Exercise specialists are beginning to move away from a prescriptive view of exercise to an approach that includes a variety of activities, with an emphasis on moderation and enjoyment of being physically active (Edwards, 1994). Further attempts must be made to increase the physical activity lifestyle behaviors of individuals. Approaches must be multidimensional in nature and include learning

about readiness to change, knowledge about the effects of physical inactivity, political advocacy, and community interventions (Morrow et al, 1999). There is no single intervention that is effective for all individuals but there needs to be collaborative efforts between professional, local, provincial, and federal agencies to affect physical activity behaviors (Morrow et al, 1999).

From a philosophical perspective, the concept of active living is broader than the individual as it becomes a part of society and social norms that deals with the problems associated with physical inactivity and the means and ways of getting people to be physically active. In Health Canada's definition of active living, it eludes to it being valued and integrated into daily life (Health Canada, 2001). Health Canada's goal is to have a larger proportion of the population adopt and sustain a physically active lifestyle. By valuing physical activity, it will become habitual; that is, it will be incorporated into a person's lifestyle and become regular throughout one's life (Health Canada, 1998; Siedentop, 1996). The value a person places on physical activity will move beyond verbal and written commitment, to the action of decision-making where a person schedules their daily life to include physical activities (Siedentop, 1996).

Valuing an active lifestyle takes more than self-involvement of individuals; there needs to be commitment by society. This includes access to participation in various activities on a local, regional and national level which must be sensitive to race, gender, age, socioeconomic status, and disability limitations. It is important to build and sustain infrastructure that is attractive and inclusive for children, youth, and adults (Siedentop, 1996). People must be knowledgeable of

activities in sport, fitness and recreation. This will help to maintain and improve the practice of their activity (Siedentop, 1996). There needs to be efforts at shaping and influencing the value of physical activity in people to positively increase self-efficacy, and decision-making and behavioural skills (Siedentop, 1996).

The active living approach to physical activity is inclusive in that it should involve all Canadians in physical activity, especially the sedentary and 'hard-to-reach' individuals. It is these individuals that government and major health organization initiatives need to capture in order to help them achieve optimal health and lower the risk of chronic disease (Bercovitz, 2000). Research has established the link between physical activity and lowered risk of chronic disease (Blair & Connelly, 1996; Lee & Paffenbarger, 1996). This can be seen from the numerous benefits from physical activity. Some general benefits associated with physical activity as it relates to chronic illness include: decreased risk of all-cause mortality by more than 25%, increased life expectancy of 2 years over the population average, decreased risk of stroke, improved lipid profiles, improved glucose tolerance, and weight management (McGinnis, 1992).

2.3 Physical inactivity levels of Canadians

Recent reports suggest that Canadians are highly inactive, at levels that are insufficient for optimal health benefits (Canadian Fitness and Lifestyle Institute, 2000). According to the *2000 Physical Activity Monitor* published by the

Canadian Fitness and Lifestyle Research Institute (CFLRI), 61% of Canadian adults were considered inactive, and women (67%) were more inactive than men (54%). Inactivity was defined as activities beyond those of daily living that expend fewer than 1.5 kcal/kg body weight per day during the three months prior to the survey. The inactivity levels of children are also high, with girls (62%) being more inactive than boys (52%) (CFLRI, 2000). Inactivity in children was defined activities beyond those of daily living that expend less than eight kcal/kg body weight per day.

Physical activity patterns of Canadians have been consistently monitored since 1981. Each year, CFLRI publishes a *Physical Activity Monitor* outlining activity levels of Canadians. Since 1981, the reports suggest that Canadians have become more active, from 21% (1981) to 39% (2000) (CFLRI, 2000). However, there have been changes in the way the surveys have been conducted. The questions being asked to Canadians about their physical activity levels are similar throughout the surveys. However, data collection methodology has changed over the years. For instance, the 1981 *Physical Activity Monitor* had interviewer completed questionnaires administered face to face in the respondent's home. However, more recent surveys (1995-2001) have administered the questionnaires with telephone interviews. This change has seen a decrease in the response rate. In 1981, 85% of respondents participated in the survey and in 2000 there was only a 52% response rate. The distribution of respondents was not evenly distributed across the country. In total there were 5148 respondents in the 2000 *Physical Activity Monitor*, with 27.4% of

respondents from Atlantic Canada, 25.1% from Western Canada, 19.0% from Ontario, 18.0% from the territories and 10.5% from Quebec (CFLRI, 2000).

Currently, federal, provincial, and territorial governments have a goal to reduce physical inactivity by 10% by the year 2003 (Federal, Provincial, and Territorial Advisory Committee on Population Health, 1999). Recently, governments have begun to re-invest into initiatives that aim to decrease population physical inactivity (CFLRI, 2000).

Although dietary and physical activity behaviors are individual choices, they are influenced by physical and social factors intrinsic to the individual and behavior setting. Environmental changes in the home, workplace and community have in part, lead to less healthful eating and physical activity behavior choices (Booth et al, 2001; Hill et al, 2001). Building architecture and community structure has led people to be more reliant on cars and other transport devices such as elevators and escalators. These technological changes have decreased the opportunities for individuals to be physically active as part of daily life. Changes to school physical education time and safety concerns for children in unsupervised play areas limits the amount of both structured and free time opportunities that children have to be physically active. Increased technology has brought with it a reduction in leisure time. People no longer have adequate time to engage in physical activities (Booth et al, 2001; Hill et al, 2001).

Children are inactive (57%), with girls being more inactive than boys (CFLRI, 2000). Inactivity is defined as activities beyond those of daily living that expend less than 8 kilocalories/kg body weight per day. Among grade-school

children aged 5-12 years, 56% of girls are inactive and 47% of boys are inactive. In the teenage years of 13-17, their level of inactivity increases, with girls (70%) more inactive than boys (60%) (CFLRI, 2000).

Inactivity levels of children can be explained in part by technological advances in entertainment (Molnar & Livingstone, 2000). The most popular leisure time activity among children is TV viewing, with 20-30% of children and adolescents watching 4 hours or more of TV each day (Health Canada, 2001). Boys are more likely to watch more television than girls. Other physically inactive past times include playing video games and use of computers. Between 34-41% of boys in grades 6-10 play more than 4 hours of computer games per week. The number of girls spending more than 4 hours per week playing computer games is relatively low (Health Canada, 2001).

Although boys tend to spend more time watching television and playing video games than girls, boys engage in more physical activity during the time after school and before supper. Boys (62%) spend more time outdoors riding bicycles and walking than girls (41%) do. Girls spend more time doing homework and other physically inactive behaviors, such as reading (CFLRI, 2000).

2.4 The costs of physical inactivity

A physically active individual will be more physically fit, will lead a higher quality of life with lower chronic disease risk and will have greater longevity compared to a person who is physically inactive (Paffenbarger et al, 1994). An

inactive or sedentary lifestyle results in a significant toll in terms of human life and medical costs. Sedentary individuals are at a higher risk for chronic illness. They are at twice the risk of developing coronary heart disease than those with an active lifestyle (Blair & Connelly, 1996). As well, they are at greater risk of obesity, hypertension, and Type 2 diabetes (Blair & Connelly, 1996; Katzmarzyk et al, 2000; Keeler et al, 1989; Wei et al, 2000).

The external costs of a sedentary lifestyle are significant – costs that others pay as a result of an individual's decision to lead a relatively inactive lifestyle rather than exercise (Keehler et al, 1989). Keehler et al (1989) stated that if sedentary individuals were more active they would live longer and reduce the costs they impose on others. In Canada, the estimated health care costs associated with physical inactivity total $2.1 billion and could be as high as $3.1 billion (2.5% of the total health care costs) (Katzmarzyk et al, 2000). The external costs of a sedentary lifestyle are almost double the external costs of smoking (Katzmarzyk et al, 2000; Keehler et al, 1989). Katzmarzyk et al (2000) also estimated the cost savings by promoting active living. If 10% of inactive Canadians became active, there would be a cost reduction of $150 million. The expected savings would not be immediate, as the benefits of a physically active lifestyle accrue over a lifetime (Katzmarzyk et al, 2000).

2.5 Physical activity and chronic disease

Research supports the relationship between physical activity and decreased risk of chronic disease. Physical activity can significantly impact many diseases, including CVD, obesity, type 2 diabetes, osteoporosis, and cancer. All of these are important diseases that affect Canadians. The role of physical activity can be demonstrated by reviewing its importance in the prevention and treatment of CVD and obesity. A summary of the importance of physical activity and other diseases will be presented.

2.5.1 Cardiovascular Disease

Cardiovascular disease is the leading cause of mortality in Canada, accounting for 37% of all deaths in 1996 (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999). Recent studies have demonstrated that comprehensive risk factor interventions, including physical activity, decrease the risk of CVD (Franklin & Sanders, 2000; Roth, 1993; Smith et al, 1995). Along with high prevalence rates of CVD, the economic burden on Canada's healthcare system is costly. In 1999, approximately $2.5 billion accounted for hospital care, physician care, drugs, and research related to CVD (Barr, 2001; Katzmarzyk et al, 2000).

Physical inactivity is an independent risk factor for certain diseases, as are smoking, high blood pressure, and high cholesterol levels (Blair, Kohl & Gordon, 1992; Grundy et al, 1999; Paffenbarger & Lee, 1996). In 1992, the American

Heart Association (AHA) added 'sedentary lifestyle' to its list of major risk factors for coronary heart disease (AHA, 2002). Recent estimates of risk factors of Canadian adults indicate that 28% are smokers (Statistics Canada, 2000), 20% have high blood pressure (Joffres et al, 1992), 26% have high blood cholesterol (MacDonald et al, 1992), and 61% are inactive (CFLRI, 2000). Thus, increasing physical activity levels of Canadians would have the greatest potential in reducing CVD (Katzmarzyk, 2000).

Physical activity has been shown to reduce the risk of CVD by increasing cardiorespiratory endurance (Getchell, 1998, 66; Raitakari et al, 1994; Wannamethee & Shaper, 2001), improving blood pressure (Hagberg et al, 2000; Hardman, 1999; Haskell et al, 1992; MacKnight 1999), and regulating blood cholesterol and serum lipids (Franklin & Sanders, 2000; Stone et al, 1996; Yu-Poth et al, 1999). Cardiorespiratory endurance strengthens the heart and enhances the circulatory system to pump blood through vessels, and increases lung capacity and respiratory function to deliver oxygen to tissues (Getchell, 1998, 66-67).

The effect of physical activity on hypertension is well documented (Bove & Sherman, 1998; Franklin & Sanders, 2000; Hagberg et al, 2000; Haskell et al, 1992). Bove and Sherman (1998) indicate that regular aerobic exercise (at least one half-hour of endurance exercise at 50 to 70 percent of maximum heart rate performed at least 3 days per week) helps prevent hypertension and that in individuals who already have hypertension, exercise has been shown to lower systolic and diastolic blood pressure by a combined mean of 10mmHg. The

reduction does not completely normalize blood pressure but has substantial clinical significance and may eliminate or reduce the need for antihypertensive medications in some individuals (Bove & Sherman, 1998; Franklin & Sanders, 2000; Hagberg et al, 2000; Haskell et al, 1992). Low to moderate-intensity activities are as efficacious as high-intensity activities in lowering blood pressure in hypertensive individuals (Bove & Sherman, 1998; Haskell et al, 1992; Stewart, 2000).

Physical activity results in the normalization of cholesterol by changing the ratio of high density lipoproteins (HDL) to low density lipoproteins (LDL) to favor an increase in HDL and a decrease in LDL (Haskell et al, 1992). Studies have shown that endurance activities can result in an increase in HDL cholesterol (Despres & Lamarche, 1994; Duncan et al, 1991; Hardman et al, 1989). Hardman et al (1999) studied middle-aged women with low levels of HDL (mean 1.2 mmol/L) at baseline, who completed a brisk walking program of 20 km/week. A 27% increase in HDL levels was observed.

Together, diet and exercise are effective in treating and preventing CVD. Hellenius et al (1993) reported results from a randomized, controlled, clinical trial that compared diet (low-fat diet), exercise (moderate intensity), and the combination of diet and exercise in middle-aged men with moderately elevated CVD risk factors. In the diet and exercise group, blood levels of total cholesterol, LDL and very low density lipoprotein (VLDL) cholesterol were reduced. The diet group had lower LDL levels only, and the exercise group had lower VLDL levels only. In a study by Singh et al (1992), men at risk of CVD who consumed a low-

fat diet and exercised regularly had a greater decrease in body weight and blood lipids and a significant increase in HDL cholesterol compared to those who did not exercise.

2.5.2 Obesity

Obesity is a major health concern because the prevalence is increasing in all sectors of the population. It is recognized that physical activity plays an important role in prevention and treatment of obesity. Dietitians of Canada (2001), and the ADA (1998) have stated that for successful weight loss and weight management, physical activity is crucial. They recognize that dietary control alone has limited success in controlling obesity (ADA, 1998; Dalton, 1998; Dietitians of Canada, 2001). The accumulating evidence clearly supports the need for physical activity in weight management strategies.

Although there is a slight increase in the physical activity levels of Canadians, the majority are still inactive. This has been linked to the increased prevalence of obesity, morbidity and mortality (Tremblay, Doucet & Imbeault, 2000). But there is debate whether or not physical inactivity causes obesity or if obesity causes physical inactivity (Weinsier et al, 2000). Research does indicate that obesity is more prevalent in sedentary individuals (Weinsier et al, 2000). Researchers involved in the National Health and Nutrition Examination Survey (NHANES) Epidemiologic Follow-up Survey concluded that low levels of physical activity may be a cause as well as a consequence of weight gain (Weinsier et al, 2000).

The prevalence of obesity in adults and children is increasing dramatically (Ravussin & Bogardus, 2000). Based on 1996-97 body mass index (BMI) data from Statistics Canada (1999), 34% of Canadian adults aged 20-64 years were considered overweight (BMI>25), and 13% were obese (BMI>30). The prevalence of obesity among children has increased considerably over the past decade. Current estimates suggest that the prevalence of overweight (BMI>85th percentile) boys changed from 15% in 1981 to 35.4 % in 1996, and increased from 15% to 29.2% for girls. The prevalence of obesity (BMI>95th percentile) over that period tripled, from 5% to 16.6% for boys and 5% to 14.6% for girls (Tremblay & Willms, 2000).

There is a high number of people attempting to lose weight. In the United States, from a sample of 107,804 adults, Serdula et al (1999) estimated that 28.8% and 35.1% of men and 43.6% and 34.4% of women had previously attempted to lose or maintain weight, respectively. The most common strategy was to consume less fat, but not fewer calories (34.9% of men and 40.0% of women). Fewer reported using the recommended combination of dietary control and regular physical activity (21.5% of men and 19.4% of women). They also found that this combination was less frequently reported among individuals who were obese, less educated, and over 70 years of age. From their findings, they concluded that health care professionals need to better communicate the importance of physical activity in weight management (Serdula, 1999).

Overweight and obese individuals are at a higher risk for many chronic diseases including coronary heart disease, hypertension, and type 2 diabetes

(Rippe & Hess, 1998). There is strong scientific support for the importance of physical activity for the prevention and management of obesity; it is of specific importance to achieve energy balance, a leaner body composition, and adherence to weight management strategies (Rippe & Hess, 1998). Although individuals inherit metabolic characteristics, unfavorable environmental conditions and poor lifestyle choices also contribute to the development of obesity (Ravussin & Bogardus, 2000).

Physical activity can affect two main components of energy balance: resting metabolic rate (RMR) and the energy cost of physical activity (Ravussin & Bogardus, 2000; McGuire et al., 1999; Rippe & Hess, 1998; Molnar & Livingstone, 2000). Rippe and Hess (1998) have shown that persons who increase their physical activity also increase their RMR (Rippe & Hess, 1998). An individual's RMR can remain elevated for several hours after exercise. However, RMR can decline after even a short period of detraining (Schrauwen & Westerterp, 2000; Rippe & Hess, 1998).

The most direct way that physical activity affects energy balance is from the amount of energy expended during the activity. An individual who is physically active 30 to 45 minutes, 5 to 7 days per week can expend upwards of 300 kcal/day or 1,500 to 2,100 kcal/week. But even small amounts of physical activity achieved consistently can have a profound effect on weight loss (Rippe & Hess, 1998).

Physical activity promotes positive changes in body composition by preserving lean tissue and promoting fat loss. Pritchard et al (1997) compared

body composition in overweight middle-aged men who, for 12 months participated in one of two weight loss interventions – low-fat diet ad libitum with activity levels unchanged; or moderate, unsupervised exercise with diet unchanged. They measured weight, total and regional fat mass and lean mass, energy intake, percentage dietary fat, and physical activity indices. Mean weight loss in the diet intervention group was 6.4±3.3 kg and 2.6±3.0 kg was lost in the exercise intervention group. Body composition was measured using dual energy x-ray absorptometry (DXA), and the scans revealed that in the diet intervention group, 40% of the weight loss was lean tissue while in the exercise intervention group, less than 20% of the weight loss was lean tissue. Similar outcomes have been shown by Weinsier et al (2000) and Rippe & Hess (1998).

Treatment of obesity in children has concerns of its own. Physical activity is an integral component of the treatment of childhood obesity and in weight management. Increasing physical activity remains an important treatment strategy for childhood obesity (Molnar & Livingstone, 2000). Because physical activity offers numerous health benefits and has minimal risk of adverse effects in children, it is the first-line of therapy for obese children (Rippe & Hess, 1998). However, treatment research suggests that physical activity alone is not adequate for weight loss but a combination of a healthy diet and physical activity is more effective for long-term changes (Epstein, 1995)

2.5.3 Other Chronic Diseases

Physical activity impacts illnesses other than CVD and obesity, including osteoporosis, cancer and type 2 diabetes. A minimal amount of physical activity is necessary for all ages to maintain bone mass (Barr, 2001). Physical activity can help protect against bone fracture by increasing balance and muscle tone, thus reducing the risk of falling (NIH Consensus Development Panel on Osteoporosis Prevention, Diagnosis and Therapy, 2001). Also, physical activity can help to build bone within the limits set by hereditary factors, nutrition, hormonal status, and bone strength (Vuori, 1996).

Research supports the fact that physical activity can have protective effects on certain types of cancers. In a Norwegian prospective study, sustained physical activity had demonstrated protective effects against cancers of the prostate, colon, and breast (Thune et al, 1997). Physical activity has also been demonstrated to be effective in the treatment and rehabilitation of patients with cancer. It may reduce cancer recurrence and enhance survival by improving bodily movement, reducing fatigue, and enhancing immune function (Courneya et al, 2000; Dimco et al, 1999).

Physical activity is important in controlling type 2 diabetes. It helps regulate blood glucose levels by decreasing insulin resistance. Several studies have reported an association between physical activity and type 2 diabetes (Helmrich et al, 1991; Kriska et al, 2001a; Kriska et al, 2001 b; Manson et al, 1992). Kriska et al (2001a) examined the relationship between physical activity and insulin and glucose concentrations of 530 Native Canadians and concluded

that physical activity was independently associated with fasting insulin concentrations in men, suggesting benefits from physical activity on insulin sensitivity. Although there were no significant benefits for women, they explained that this was most likely related to the measurement of activity and that it appeared women were less active than men. The 1998 Clinical Practice Guidelines for the Management of Diabetes in Canada recognizes the role of physical activity in preventing and treating diabetes, related to improving glycemic control, insulin sensitivity, and other related risk factors such as CVD and obesity (Meltzer et al, 1998).

2.6 The role of the dietitian in promoting active living

Dietitians are highly trained professionals in the area of healthy eating and the treatment and prevention of chronic disease through nutrition. However, they recognize the importance of physical activity in these diseases (Barr, 2001). Dietitians are in an ideal position to promote active living by combining healthy eating and active living messages. Dietitians of Canada (2001) state that "dietitians utilize health promotion, disease prevention and treatment strategies that support communities and individuals to make healthy eating and active living choices" (page 2), and "population health promotion strategies that promote healthy eating and active living help to reduce the incidence of chronic illnesses" (page 11). In a position statement from The American Dietetic Association (1998), it states that "optimal nutrition and physical activity can promote health

and reduce the risk of chronic disease. Qualified dietetics professionals should play an integral role in health promotion and disease prevention programs" (American Dietetic Association, 1998, 205). Currently, dietitians promote the Canadian Guidelines to Healthy Eating (Health Canada, 1991) and one of the guidelines supports the benefits of physical activity in weight management: "achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating".

Dietitians have a pivotal role in areas of the health care system that focus on health promotion and disease prevention. To integrate new roles into their practice, dietitians must include education, practice, and research activities that include comprehensive approaches to enhance healthy behaviors of individuals (ADA, 1998). Dietitians need to "develop and be trained to use skills in program facilitation, counseling, education, communications, community assessment, surveillance, evaluation, and policy development" (ADA, 1998, 207). They can incorporate these skills with advanced study, continuing education, and active learning through practical, experimental training (ADA, 1998).

2.7 The role of focus groups in qualitative research

Focus group interviews have been developed as a tool in research and have been used to investigate specific research questions (Krueger & Casey, 2000). They are a qualitative approach to elicit perceptions of a defined population (Sim, 1998) by allowing participants to share experiences, opinions,

and attitudes about an issue (Krueger & Casey, 2000, 3). Focus groups have been employed by nutrition researchers to assess beliefs and attitudes, design educational materials and programs, and to evaluate educational programs (James et al, 1997). A study by Dahlke et al (2000) used focus groups as a predictor of dietitians' roles on interdisciplinary teams in the acute care setting. The results from the focus groups were used in answering their overall objective – to better understand the diverse thoughts and activities of dietitians regarding interdisciplinary teams to target future performance and education (Dahlke et al, 2000). The goal of focus groups is not to make generalizations about the data, but instead, generate in-depth discussions on a topic (Krueger & Casey, 2000, 203).

Focus group data can also be used in questionnaire development, to inform the choice of words or phrases of questions. O'Brien (1993) used focus groups as a tool to develop a health questionnaire to assess experiences related to the human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) epidemic (O'Brien, 1993). Focus groups can aid in questionnaire development by (1) informing the actual content of the questionnaire including wording and item development, and (2) providing an understanding of how the research relates to the population being studied (O'Brien, 1993).

Focus groups have also been used to design effective intervention strategies for individuals. Young et al (2001) conducted focus groups with African-American women attempting weight loss in order to develop an exercise

program to support their weight loss. They identified barriers (health concerns and social influences) and motivators (weight control and stress reduction) of exercise. The results of the focus group assisted the researcher in developing a culturally sensitive intervention program by understanding the issues related to the target population.

Focus group interviews are used to identify the perceptions, feelings, and thoughts of people about issues, products, services, or opportunities (Krueger and Casey, 2000, 12) and can provide researchers with valuable insights into conducting complicated investigations (Krueger and Casey, 2000, 24). They can be used as a needs assessment tool; to gain understanding about a topic or phenomenon. Assessing needs can be challenging and focus groups are helpful by providing an interactive environment that allows participants to reflect and listen to experiences and opinions of others.

2.8 Behavior change theories

Several theories propose why an individual engages in a particular behavior and can be used as a model for behavior change. Common theories that help explain behavior change are Ajzen and Fishbein's (1985) Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) (an adjunct of TRA), and Bandura's (1986) Social Cognitive Theory (SCT). Although these theories explain influences of behavior change, it is the predictor of the change that differs.

According to the TRA, the most immediate predictor of an individual to engage in a given behavior is intention (Ajzen & Fishbein, 1980). Hagger et al (2002) explains the link between intention and attitude. The TRA posits that intention is mediated by attitudes and subjective norms. Attitudes reflect a disposition for an individual to engage in a particular behavior as it represents their beliefs regarding the effectiveness of the behavior to successfully produce outcomes (Hagger, Chatzisarantis & Biddle, 2002). The TRA applies to those behaviors under volitional control. Ajzen (1985) recognized that not all behaviors are volitional and included perceived behavior control (PBC) in the Theory of Planned Behavior as an independent predictor of intention. PBC accounts for an individual's perception of their capability to engage in a behavior (Hagger et al, 2002).

Smith and Biddle (1999) completed three studies that compared attitudes and exercise adherence of new members of a health club using the TRA and TPB. In the first study, the TRA accounted from 13.1% of the variance in adherence after 4 months. The TPB was used in the second study to predict physical activity and sedentary behavior. They concluded that physical activity was predicted from the intentions and control over sedentary behavior. In their final study, an educational intervention with previously sedentary individuals, they concluded that intentions to be active over a 10-week intervention were associated with planned behavior variables (Smith & Biddle, 1999).

Most of the prevalent health behavior theories are unidirectional in their predictions, including the TRA and TPB. They do not explain how individuals

develop their perceptions nor account for the role of prior behaviors in shaping these perceptions (Rimal, 2001). Bandura's (1986) SCT acknowledges the reciprocal relationships between behavioral, personal, and environmental determinants. They continuously modify, and are modified and influenced by each other.

Social Cognitive Theory recognizes that beliefs of personal efficacy are the most pervasive predictor of behavior (Bandura, 1986). If an individual does not believe he or she can produce desired outcomes, they will have little incentive to partake in the behavior. Their perceived self-efficacy relates to their ability to organize and execute the steps required to produce the desired outcome (Bandura, 1997) and goes beyond their perception of competency (Bandura, 1986). It is an assessment of their confidence or ability to perform skills while achieving a successful outcome (Bandura, 1986). Individuals develop personal assessments of their abilities through four sources: performance accomplishments; verbal persuasion; vicarious performance; and physiological arousal (Bandura, 1997). Bandura (1997) notes that performance accomplishments are the most reliable source of self-efficacy because they are based on personal experiences.

Increasing self-efficacy can be accomplished in part by increasing knowledge and behavioral intention. Knowledge is an inherent strength of communication and an essential precursor to behavior change (Maiback & Cotton, 1995). However, knowledge alone does not predict behavior change but is a predictor of self-efficacy (Egbert & Parrott, 2001). Egbert & Parrott (2001)

investigated self-efficacy and women's (n=206) performances of breast and cervical cancer detection practices. Their results indicated that actual knowledge was related to increasing self-efficacy but there was no relationship between women's knowledge only and breast and cervical cancer detection practices.

An effective method in facilitating an increase in knowledge is through education (Rimal, 2001). A study by Noel and Ames (1989) investigated dietitians' attitudes, knowledge, and problem-solving approach to aging. They concluded that continuing education on aging had a positive influence on dietitians' attitudes and knowledge about the economic and health related issues of aging adults (Noel and Ames, 1989). Rimal (2001) studied the central tenet of social cognitive theory on exercise behavior in adults (n=2125) engaging in moderate and vigorous physical activity; that individuals' understanding and behaviors are mutually reinforced by each other. It was concluded that self-efficacy predicted behavior.

Eckstrom et al (1999) investigated changing physician practice related to physical activity by conducting education workshops to improve self-efficacy and counseling behaviors. The 2-hour workshops were based on the stages of change behavioral model and included information about physical activity counseling skills using the behavioral model for elderly patients with chronic illnesses. They concluded that educational interventions were effective in improving self-efficacy about physical activity counseling (Eckstrom et al, 1999).

The literature supports the need for dietitians taking a proactive role in promoting active living as health care priorities and initiatives change. Health

promotion and disease prevention rely on dietary and physical activity interventions to reduce the risk of chronic illness. Self-efficacy is an important aspect of behavior change and ability to perform a duty. Education to improve knowledge, attitudes, and self-efficacy can help facilitate behavior change among dietitians.

Thus, in the following study (Chapters 3-5), focus groups were used to identify the role and needs of dietitians in promoting active living as part of nutrition counseling. The results of the focus groups were used to develop the content of an educational workshop on active living and to develop a questionnaire to assess knowledge, attitudes, and self-efficacy of dietitians in promoting active living. To our knowledge, there were no published reports of investigations on the development of educational strategies to improve the efficacy of dietitians in promoting active living.

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Chapter Three: Dietitians' perceptions with regards to incorporating active living into nutrition counseling

3.1 Introduction

This chapter describes the use of focus group interviews for the initial stage of an exploratory study to identify the perceptions of dietitians with regards to incorporating active living into nutrition counseling. From the focus groups, it was anticipated that the participating dietitians would support the need to promote active living. If the support existed, the next stage of the study would be implemented – developing and conducting an educational workshop in the areas of active living and physical activity designed to improve dietitian's self-efficacy to promote active living. The purpose of the focus group interviews was to examine: (1) the role of the dietitian in promoting active living and (2) the needs of the dietitian to promote active living.

Research supports the relationship between nutrition and physical activity in the prevention and treatment of chronic diseases (American Dietetic Association, 1998; Blair et al., 1996; Dalton, 1998; Frankish, Milligan & Reid, 1998; Wei, Schwertner & Blair, 2000). Recently, healthy eating and active living have become constructs in health promotion and increasingly, the two messages are being combined (American Dietetic Association, 1998; Troiano, Macera & Ballard-Barbash, 2001). When discussing health and wellness, it is impossible

not to discuss the two constructs. Thus, it is logical that nutrition and physical activity be discussed as complementary components of a healthy lifestyle.

The nutrition community supports the view that nutrition and physical activity are imperative in preventing and treating chronic lifestyle diseases. In 1991, Health Canada published *Canada's Guidelines to Healthy Eating* as a way to communicate healthy messages to all Canadians (Health Canada, 1991). One of the guidelines states "achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating" (Health Canada, 1991). In 1998, the American Dietetic Association released the following position statement: "It is the position of The American Dietetic Association (ADA) that optimal nutrition and physical activity can promote health and reduce the risk of chronic disease" (American Dietetic Association, 1998).

In 2000, the United States set a precedent in the new *Nutrition and Your Health: Dietary Guidelines for Americans,* in that they clearly place emphasis on a non-dietary guideline: "Be physically active each day" (Troiano et al, 2001, 451S). Although promoting physical activity has been part of the guidelines since the 1970's, only now has it been separated from nutrition. In the past, it was presented in context of weight management, as in Health Canada's guideline. The 2000 Dietary Guidelines Advisory Committee recommended physical activity be separated from weight management guidelines to "increase recognition of the multifaceted relationships between nutrition and physical activity that go beyond weight management", and to "provide a clearer, more understandable, and more forceful message to consumers" (Troiano et al, 2001, 451S).

Although the two messages are combined from a health perspective, there are no guidelines for dietitians to promote them collectively. Nutrition and physical activity professionals are effective at promoting wellness but there is no system in place to facilitate collaboration between the professions. To effectively combine these messages, all health professionals, including dietitians must be involved in delivering them to the public.

The healthy eating and active living messages apply to general health. They are simple messages that can be promoted by all health professionals. However, they do not represent rigid medical nutrition therapy or prescriptive exercise, respectively. The extent of knowledge necessary to counsel on diet intervention and exercise prescription goes beyond the capabilities of every health professional and needs to remain in the respective professions.

Theoretically, dietitians are in an ideal position to promote active living. They have extensive knowledge of chronic diseases and health and wellness. They are highly skilled at counseling on nutrition, and behavior change. Many of the counseling strategies effective for altering dietary habits apply to altering physical activity habits. However, there may be several practical reasons preventing the "marriage" of healthy eating and active living into nutrition counseling.

There is literature to support the need for dietitians to promote physical activity along with nutrition. Weight management is an area in which dietitians counsel. The American Dietetic Association (1997) defines weight management as "the adoption of healthful and sustainable eating and exercise behaviours

indicated for reduced risk and improved feelings of energy and well-being". They also recognize a dietitians' expanded role in weight management by assisting patients with coping skills, motivation techniques, physical activity, and food behaviour change. In context with management strategies, the ADA (1997) recommends health care professionals "counsel clients to help them reduce their focus on weight loss and food and establish a more constructive focus in life...that may include counselling about self-esteem and body image, and coping with societal pressure to reduce to an unrealistic weight" (American Dietetic Association, 1997). Research supports the notion that physical activity could be encouraged as a means to address issues related to weight management, (Molnar & Livingstone, 2000; Pritchard et al, 1997; Rippe & Hess, 1998; Schrauwen & Westerterp, 2000; Weinsier et al, 2000) and self-esteem and body image (Fox, 1999).

The ADA (1997) summarizes the expanding philosophy of dietitians towards weight management. As part of a multidisciplinary practice, dietitians can "use their unique food and nutrition skills to help individuals and groups maintain healthy weights through lifelong commitment to healthful eating practices and physical activities that are sustainable and enjoyable" (American Dietetic Association, 1997).

Focus group interviews are used to identify "the perceptions, feelings, and thinking of people about issues, products, services, or opportunities" (Krueger and Casey, 2000, 12) and can provide researchers with valuable insights into conducting complicated investigations (Krueger and Casey, 2000, 24). They can

be used as a needs assessment tool; to gain understanding about a topic or phenomenon. Assessing needs can be challenging and focus groups are helpful by providing an interactive environment that allows participants to reflect, discuss and listen to experiences and opinions of others.

Selecting individuals to participate in a focus group is different from traditional sampling methods typical in quantitative research. Focus group participants are selected to purposefully identify individuals who either possess characteristics of interest or who have distinctive experience within a research topic (Creswell, 1998). It is a special group of people in terms of purpose, size, composition, and procedures (Krueger and Casey, 2000, 4). Focus groups are intended to promote self-disclosure among participants to reveal what they truly think and feel. Focus groups are unique to other types of groups in that they possess the following aspects: people who possess certain characteristics and provide qualitative data in a focused discussion to help understand the topic of interest (Krueger and Casey, 2000, 10).

The goal of this phase of the study was to elicit discussion from dietitians regarding the issues and concerns that would affect their ability to incorporate active living into nutrition counseling. To identify any specific issues and concerns, dietitians were surveyed with the use of focus group interviews regarding their perceptions about active living. Subsequently the information was to be in the development of a workshop, if warranted.

3.2 Methods

Focus Group Participants

Focus group interviews were conducted with registered dietitians and dietetic interns in cities throughout Alberta. It was the researcher's goal to have between 6-12 participants in each focus group (Kreuger & Casey, 2000).

Recruitment

Participants were recruited by a regional liaison identified by the principal investigator. The liaison agreed to invite participants they knew who counseled clients on active living or had a strong interest in the area of active living. Invitations were sent to each liaison and it was their responsibility to forward the invitations to the potential participants. The potential participants then contacted the investigators directly with confirmation of attendance. Each liaison was invited to participate in the focus group.

Moderating the Focus Groups

At each focus group, there was a moderator and an assistant moderator. The same moderator conducted all of the focus groups – the researcher (MS). The same assistant moderator was present for the first five focus groups and a second assistant moderator was present for the last focus group. The moderator had several responsibilities. He began with a preamble to set the stage for the focus group. In the preamble, the participants were welcomed, introduced to the

topic of active living, provided with Health Canada's definition of active living, and given an explanation of the focus group procedures and how it would be implemented. The participants were encouraged to share their views and opinions, even if they differed from views already shared. Also, participants were made aware that the session would be audio-taped and would remain confidential. They were assured that no names or identities would appear in any reports.

The assistant moderator was responsible for operating the audio equipment that was used to record each session. She took handwritten notes of the discussion and recorded non-verbal cues that would indicate agreement or disagreement of the discussion. Chronological time points were also included in the notes. Immediately after each focus group, the moderator and assistant moderator held a debriefing session together regarding the focus group.

Focus Group Script

The moderator was responsible to ask scripted questions with probes to generate and maintain discussion (Figure 3-1). The questions were exploratory, open-ended, and accompanied by probes to help keep the discussion focused. The question order was structured so that opening questions were not controversial so as not to set a negative tone to the focus group. Thus, the first two questions explored participants' own experiences with active living counseling. The remaining questions addressed their perceptions, views, and opinions about incorporating active living into nutrition counseling.

The script was reviewed in detail by the researchers (2 nutrition professors and 2 graduate students). The scripted questions covered five broad topic areas: types of clients the dietitians counsel on physical activity; current counseling practices for physical activity; perceived role of the dietitian in promoting active living; perceived needs of the dietitian to promote active living; and their current monitoring practices used for physical activity. Within each of these broad topics areas, subtopics were explored. At no time did the moderator engage in discussion nor give indication of agreement or disagreement to comments, so all major, minor, positive, and negative views were encouraged during the discussion.

- Describe the clients to whom you would likely provide information and advice about physical activity. For example, conditions they are being seen for, demographics, or other client information.
- What advice do you provide to your clients about being physically active? Where do you get your ideas for helping your clients to be active?
- What role do you feel dietitians should play in promoting active living? What about specific information? What about providing specific advice? What about monitoring physical activity?
- What would help dietitians to be more effective in counseling clients on physical activity? What about knowledge? What about counseling skills? What about resources?
- How do you know whether your clients follow any advice you give them about physical activity? Do you monitor physical activity in your clients?
- Have we missed anything?

Figure 3-1. Focus group script.

Focus Group Interviews

Approval for this study was obtained from the Faculty of Agriculture, Forestry and Home Economics Human Ethics Review Committee, University of Alberta. At the beginning of each focus group, participants gave informed consent and were asked to complete a brief demographic information form (Appendix 1). The questions from the information form pertained to their career and practice. Such questions included age groups of their clients, and whether or not they currently counsel their clients on physical activity and if so, for how long.

Each focus group session lasted from one to two hours. Once the moderator was confident the topic areas had been exhausted, the focus group was concluded. He gave a brief summary of the discussion and posed the final question "Have we missed anything?" This allowed the participants to respond with other views or opinions that they felt were not covered in the focus group but were important for them to address. It allowed the moderator and the participants to clarify any responses that may have seemed unclear. After the moderator and all of the participants were satisfied with the discussion, the moderator gave closing remarks. He thanked them for attending the focus group. He explained the research project in more detail and explained the 2-day educational workshop that was to take place within the following year. Each participant was invited to attend the workshop.

In total, the moderator conducted six focus groups in order to capture urban and rural centers of Alberta. The first focus group was used to pilot-test

the focus group script. After completing the first focus group, no changes were made. Thus, the transcripts from the first focus group were included in the analysis. The audiotapes were later transcribed verbatim and analysed.

Focus Group Transcripts

After conducting the six focus groups, the moderator was responsible to transcribe each one verbatim. A transcribing machine was used to listen to each audio tape and the responses were typed into Microsoft Word 2000, Microsoft Corporation, Redmond, WA. Each transcript was later reviewed for errors by the moderator. The manuscripts were used for the analysis and summary of the focus group interviews.

Focus Group Transcript Coding

The participants were given pseudo-names to protect their identity and to ensure confidentiality. Only the researcher had access to the cross-reference list of names to pseudo-names. Each focus group transcript was transferred into the data management software package QSR NVivo Revision 1.2 (1999-2000), QSR International Pty, Victoria, Australia. NVivo 1.2 was used to organize and manage the transcripts and was not a tool used to code the focus groups. Each response had to be coded into themes and sub-themes by the researcher. This was accomplished by going through transcripts and coding each response as a theme or sub-theme as it related to the research questions. The coded information was placed into categories called nodes that are created in NVivo 1.2

(Figure 3-2). Major themes and their subthemes were placed in tree nodes. A tree node is hierarchal in structure, expanding on themes and subthemes. If a phrase could not be placed in a tree node, but was possibly relevant to the research question, then it was placed in a free node. Only information relevant to the research question was coded and placed in a node.

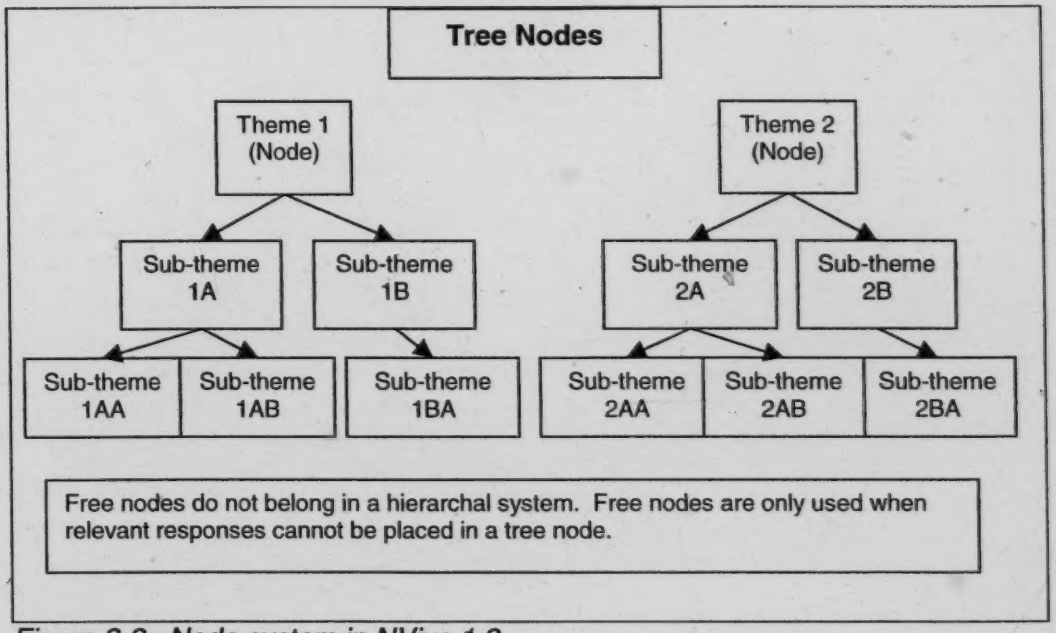

Figure 3-2. Node system in NVivo 1.2.

In order to validate the data and to ensure the data was coded without bias from the researcher, a coding team was created to verify the analysis. The coding team consisted of the researcher, the principal investigator, a research assistant, and graduate students of the principal investigator. They met regularly during the coding process. A minimum of three team members met and went through a coding report generated by NVivo 1.2 that contained the coded responses of each node. Each member either agreed or disagreed with the coding of the response in the node. If they disagreed with the coding, then they

discussed how it should be coded and what node it belonged in. Consensus was met for all coded responses. To help organize the coding process, flow charts were prepared and referred to when deciding the final interpretation of the response. The final interpretation also considered the context of the statement and the question being asked by the moderator. After each meeting, the moderator recoded those responses that were identified as improperly coded.

The first two focus group transcripts were coded and verified. The purpose of coding only the first two transcripts was to develop a system of code names that would make it easier and consistent among the remaining transcripts. However, code names of subthemes had to be revisited after each transcript was coded. No new themes or subthemes emerged after recoding the first two transcripts.

The third focus group was coded and verified. After verifying the coding of the third transcript, all team members agreed that the topics had been exhausted and that the research question had been answered as no new themes or subthemes emerged. All members were confident in the data as there was repetition in the responses of the focus groups. Once reaching the saturation point, it was no longer necessary to code the remaining focus groups. Therefore, the following analysis is based on three focus groups. Table 3-1 summarizes the focus group coding process.

Table 3-1. Summary of the focus group coding process.

1. Each focus group transcript was transferred into QSR NVivo 1.2.
2. Each response was reviewed by the researcher and was placed into a theme or sub-theme only if it related to the research question being investigated.
3. Themes and sub-themes are placed into tree nodes, created by NVivo.
4. Coded responses were verified by a coding team – researcher, principal investigator, research assistant, and 2 graduate students.
5. Coding team came to consensus regarding the final interpretation of the responses.
6. Initially, the first two transcripts were coded and verified to ensure consistency of coding.
7. The third transcript was coded and verified.
8. The coding team agreed that no new themes or sub-themes were emerging from the data and that saturation had been reached. The data supported the research questions being investigated.

To minimize potential researcher bias, several qualifiers were employed. After each focus group, the moderator summarized the discussion for the focus group participants to ensure that their views and opinions were not misinterpreted. Immediately after each focus group, the moderator and assistant moderator discussed the content of the focus group as a way of validating what was said. Field notes were taken by the assistant moderator and were reviewed by the researcher when coding the transcripts. During the verification process of the focus group coding discussions critically examined each coded response. There was consensus for the final interpretations.

3.3 Results

Six focus groups were conducted in cities throughout Alberta – Edmonton, Calgary, Medicine Hat, Grande Prairie, and Fort McMurray. These cities were considered representative of Alberta, including the major cities and rural

communities. There were 42 participants in the focus groups; 40 registered dietitians and 2 dietetic interns (Table 3-2). There were only 4 participants in the Fort McMurray focus group due to a limited number of dietitians in this northern rural community. It was important to the researchers, however, to capture this rural perspective.

Table 3-2. Focus group participant information.

Focus Group Location	(n)*	Mean No. of years practicing	No. of participants currently counseling on active living	Client Base (urban/rural)
Edmonton –Pilot	6	9.6	5	6/0
Calgary	8	11.2	3	8/0
Medicine Hat	11	15.1	8	11/0
Grande Prairie	6	9.5	4	4/2
Fort McMurray	4	13.8	4	1/3
Edmonton	7	11.8	4	7/0

*All participants were Registered Dietitians except for 2 Dietetic Interns.

3.3.1 The Role of the Dietitian to Promote Active Living

Dietitians Adopting a Proactive Role to Promote Active Living

Focus group participants were asked an initial question, "What role do you feel dietitians should play in promoting active living?" This question generated much discussion. All of the participants supported the view of having a role in promoting active living, but to varying degrees. Most agreed that dietitians should be proactive in promoting active living. The following are separate responses that support the views of many of the participants:

> *I think dietitians very easily could slip into the role of fitness with people, because that's just part of our training.*

> *Dietitians have the skills and knowledge to give those basics. You know we can't design a weight training program for somebody, competently, but we can certainly encourage activity and give general suggestions on how to do that.*

And I think that active living goes, like Kathy was saying, it goes together with nutrition counseling for almost everything you could think of. If somebody comes to me for heart health, it wouldn't be fair to them if I didn't mention active living, like it wouldn't be a complete discussion, so I just think they go together, it just makes sense to have nutrition counseling along with active living counseling.

The participants were quite enthusiastic to incorporate active living into their practice, and most of the participants were already doing so. Dietitians wanted formal training that would allow them to counsel more effectively on active living. At the time of the focus groups, most participants talked to their clients about physical activity but did not go into significant detail about it.

Barriers to Dietitians Adopting a Proactive Role to Promote Active Living

Public and Other Health Professionals' Perceptions

Overall, the participants were positive about incorporating active living into nutrition counseling and felt it could be accomplished. Among the discussion, some issues arose about barriers or concerns to adopting such a role. Some participants were concerned about how the public and other health professionals would perceive a dietitian promoting active living:

It is that time, effective use of time for the dietitian when there are other professionals that do that and that's all they do and they probably do it a much higher level than our training would allow us to do at this point.

[Do] our administrators see that being part of our job; do we need other health professionals buying into it?

I think that dietitian sometimes, we are really concerned about the process and are we, you know are we doing it right, it's almost like someone is watching over our shoulder and someone and we are going to get in trouble if we step out of the box and talk about something a little bit different.

Providing Specific Information to Clients on Active Living

Participants were asked the provoking question, "What role do you feel dietitians should play in providing specific information?" It became clear that the participants felt they had a low comfort level due to a lack of education or knowledge in exercise physiology and physical activity to provide specific information to their clients. They agreed that specific information on physical activity be left for physical activity professionals:

> *That's tricky because I think right now the way it stands, dietitians don't have enough training in exercise or exercise physiology or kinesiology to feel really competent doing that, I certainly, if I hadn't worked in fitness in another part of my life, I don't think I would feel comfortable doing that, and I think that's probably a barrier that's in place right now, that we just don't, you know, we get smidglings here and there in a physiology course or perhaps from your own personal experience largely, but in terms of a formalized knowledge base that all dietitians would possess I don't think we have that and so I don't think across the board you could, you would see that right now cause I don't think people have the comfort level to do it and the knowledge to back it up.*

> *I wouldn't feel comfortable to tell somebody how many minutes of weight training to do or how many minutes of stretching, yeah I don't have the background to do that, so that specific information I wouldn't give so it would be more general about activities to incorporate and times per week kind of thing but never specific, specific activities.*

Relative Importance to a Dietitian to Promote Active Living

Some participants put the role to provide counseling on active living into perspective of a dietitian's current role. They felt that active living was important but that it was important to counsel on active living when appropriate:

> *We can say all the things we want about a dietitian's role but the role is that they are to promote physical activity at an appropriate time.*

Not every dietitian would need to counsel on active living, such as dietitians working in critical care. Also, one participant made a comment that perhaps

there were enough issues related to nutrition that it would not be necessary to make active living a priority:

> *Exercise is one component but we've got the other problems too.*

A comment by one participant raised the issue of the relative importance of providing counseling on active living. She stated,

> *There is part where you know you start giving information that's specific about, you know length of time or type of activity or how to perform the activity, it's, you know you can't get into it half way, like you have to be prepared if you are going to start giving that to finish that picture off for the person and, you know it is that time, effective use of time for the dietitian when there are other professionals that do that and that's all they do and they probably do it a much higher level than our training would allow us to do at this point. Or is it a value-added service that you are providing to people and it's kind of hard to know where that line come.*

The Role of the Dietitian to Monitor Active Living

Participants were asked the question "What role do you feel dietitians should play in monitoring physical activity?" Most participants agreed that they do not see monitoring physical activity as part of the dietitian's role if they were to incorporate active living into nutrition counseling. Many felt they do not know enough about how to properly monitor activity; not knowing if an individual was 'doing enough', 'too much', or 'not enough'. Instead, they felt the client could monitor themselves. They agreed that the dietitian would be more of a motivator or "lifestyle coach" for the client:

> *I think they need help, I mean I think the goal is have them monitor themselves, but they sometimes need motivation or encouragement to work that into their life so ultimately I don't think the dietitian should be the one monitoring the physical activity, it should be, it just should be second nature to them to know, you know, active living is part of my life. I mean I guess eventually, they don't have to monitor it, it just becomes a way of life.*

I don't know if it is our responsibility to monitor active living in the population. I think it's the clients' responsibility. We can help by providing information, helping motivate them but ultimately it's their responsibility, in my opinion. And I don't think we should be monitoring, but goal setting is particularly important. Information pamphlets that help them set realistic goals and you help them develop a monitoring system on their own.

Role of the Dietitian to Collaborate with Physical Activity Professionals

Participants of the focus groups felt the need for better collaboration between dietitians with physical activity professionals. They thought it would be important to access resources and programs in the community or to learn more about fitness leader certifications and to whom they could refer their clients. Currently, dietitians felt there were various certifications for fitness leaders and they did not know which professional was appropriate to meet their client's needs.

I know in our work, with looking at nutrition education resources and active living resources for schools, I have yet to see something that is, you know even locally. They are kind of hit and miss, where these listings of available programs and things are. There are lots of great programs out there, it's just that you don't always hear about them as a nutritionist, and similarly I know, fitness professionals don't always hear about great nutrition initiatives that they might take advantage of. And so I think there is an opportunity to, you know, some of these things already exist and we don't need to re-invent the wheel in terms of support and resources for people if we are not going to do it ourselves; but we certainly need to do some better collaboration in terms of promoting and marketing distribution of the information to people.

3.3.2 The Needs of the Dietitian to Promote Active Living

The focus group participants were asked "What would help dietitians to be more effective in counseling clients on physical activity?" In each focus group, the participants had several suggestions.

Increased Education and Knowledge on Active Living

As a follow-up to the question previously asked, the moderator probed, "what about knowledge?" The participants of the focus groups agreed that dietitians needed additional education in exercise physiology and physical activity; suggestions included knowledge of different types of activities, physical activity professional designations, ways to monitor physical activity, and tools for assessing physical activity.

> *I think we need knowledge because I think it would make us feel better.*

> *I still think there is dietitians that don't see the separation between active living and traditional recommendations around physical activity, the, the, physical activity guide, um, if you practice in, you know, in areas where it is related, you probably have an understanding of it, have seen it, have used it but in other practice areas, people may not, may not be as relevant to their working situations, so they may not fully understand the philosophical difference between active living and prescriptive exercise is quite huge. And I think there needs to be greater understanding of that gap, so I think that's the first starting point, is to just do some basic education so that we are all on the same playing field, or that we at least have some insurance that most of us, you know, what this piece is or how it might be used or how that philosophy works, uh, you know, just as a beginning point.*

Participants felt that it would be beneficial to offer continuing education courses, conferences, and workshops in the areas of physical activity, the combination of nutrition and physical activity, and counseling. Several participants felt that more training or courses should be offered during their undergraduate degree so that students are exposed to physical activity, exercise physiology, and counseling. The following was a conversation with three of the participants:

> *Laurie: I think a really simple way that would just help to increase our knowledge is just to have conferences offered to us, continuing education*

that could combine the two disciplines, like the exercise and the nutrition, so we would have members of both teams attending these conferences and that would really create a lot of partnerships. I think they would stem from that and would have a lot more knowledge because I've never seen anything like that offered.

Kathy: That's funny, because I've gone to fitness conferences where they have nutrition stuff and to me it's just the oddest choices of topics of nutrition they would pick, like they are not, which I think is representative of our different philosophies or viewpoints about what, you know, what is possible or they will often have speakers that are billed as the nutritionists who I just think, oh my goodness, um, what are you doing here, who hired you, um, and I don't know, I think that, but I think there's a huge, I think they would, you know they tend to bring in people who, who you know, catch their eye and I think we could just as easily catch their eye and vice versa, I think they have things to offer us and I think the idea of a collaborative continuing [education] thing would be really interesting to see how it goes, you know.

Janice: I would like to see [a workshop] take the form of something really practical where dietitians could experience various types of exercises or activities so that they know first hand some of the concerns that clients might have because we really, you know, we may have one or two things that we do but we don't know what's out there for everyone and people want to choose different activities. So, um, I would like to see us involved in things as opposed to sitting there in a lecture format and having this list, you know, um, that get some more first hand experience.

Other participants shared their views on the need for more education.

Here is one participant's view:

Doing courses where you would be getting that information on physical activity, what's safe physical activity for your basic adult that does nothing or stretches, that are safe, that aren't contraindicated. I'm looking at workshops or whatever, like I think there is an ability for people to learn that. We have our basic science, we have our basic, you bring in somebody who could, who has experience, that practical experience but has scientific basis behind it.

The Need to Collaborate with Physical Activity Professionals

All of the participants agreed that there needed to be increased communication between dietitians and physical activity professionals. Some

participants were confused with fitness leader designations and it would help them to have a resource outlining their education and skill set. Such a resource would be used for referring clients to fitness professionals.

> *I think there are lots of things you can do on an individual level but there are things that [Alberta Registered Dietitians Association] or [Dietitians of Canada] can do on a larger level. The Alberta Centre for Well Being or the Sports Medicine Council of Alberta, those are great resources that are available and I don't often see those sorts of collaborations and again, maybe that's changing like the activity guide specificity is changing. Maybe that will change as activity and nutrition become more intertwined. I'd hope to think that would happen.*
>
> *I'd like to know, um, if I was to refer someone to a fitness consultant, I would like to know what are their backgrounds and the different names, what does that all mean and who's best to refer clients to, because I don't know that, and I think that would be good to know.*
>
> *And with the fitness professionals, um, I guess I would like to know what they actually do, the different types and what kinds of procedures they might go through or assessments they do so that, that would help us also understand what one would be more suitable for a certain client.*
>
> *And just even general background too, how fitness is assessed, you know, and what the measures are they use.*
>
> *Just sort of the breadth of what's available would be interesting to know, even within your own region or city or whatever, because there are so many things and you hear, I hear every once in a while about a really cool fitness initiative that somebody kicked up and it's really great. And, you know, it's unfortunate they do not have the resources or the skill to promote it to everybody that probably should hear about it. Then you don't send your people, it's too bad.*

The Need for Active Living Resources

For dietitians to effectively incorporate active living into nutrition counseling, the focus group participants strongly agreed that there was a need to have access to active living resources, including (1) information on physical

activity and disease states, (2) information on fitness, (3) active living tip sheets, (4) how-to resources and (5) resources to assess and monitor physical activity.

> *Fitness professionals are encouraged in their training to use Canada's Food Guide to do a basic dietary analysis of people. I mean they are not looking at anyone with a medical, you know, doing a lipid count or something, but they would use the food guide in confidence just to get a rough idea of someone that might need referral to a dietitian. You know, it's almost like a screening, it's not really an assessment it's more of a screening I think. And I think the physical activity guide certainly provides the guidance to do something similar for dietitians or encourage that in dietitians, " use this piece, it's here, it's great, um, here's how it could be used to screen out people that may need, um help beyond what you can offer", you know, it just gives you a little idea of what you want to do and I think, yeah, that kind of screening piece, would be quite useful just to add some focus to things.*
>
> *I think dietitians want to know about the safety factors to it, how much exercise is too much. If you have a client coming to you saying, you know, you are concerned about specific things, perhaps their weight is really dropping, um, are there some guidelines that would tell us that this is too much I mean, we are making these judgments ourselves, but is there anything that could be developed, or is there anything out there already that would let us know when people are going too far and what kinds of recommendations to make in that case.*
>
> *I think the more you have available to you in terms of resources to give out to people or if you have talked about a topic and if you are giving them something to take home, it's going to reinforce the message that you have just given.*

The Need for Additional Counseling Skills

As a follow-up to the question "What would help dietitians to be more effective in counseling clients on physical activity?", participants were probed "what about counseling skills?" Various responses were given. In one focus group, most agreed that dietitians already know how to counsel, and counseling on active living would be no different that counseling on nutrition. This was the dialogue:

Heather: I think counseling skills you have to have as a dietitian. If you are not a good counselor, you shouldn't be a dietitian. I think that's part and parcel with expecting to be a dietitian, I believe.

Sarah: And I don't really think you need different counseling skills for active living.

Heather: People skills.

Sarah: The challenges are so much the same.

Julie: And you can still use the same techniques.

Sarah: Techniques, the goal setting and

Erin: I think we need the basic information. I would agree. And on-going.

Heather: Sessions would be great. If they incorporate it into the university then bring it out into the population of the dietitians who are already practicing. That would be great. Education and then resources to tie it in as well.

From the other focus groups, the participants recognized that dietitians already have effective counseling skills, but the responses indicated that there was a need for continuing education and training to maintain and improve them. The following were responses from focus group participants:

I think you see a lot of dietitians wanting to get into [counseling] a little more deeply and you know, what is it that they can do unless they start taking psychology courses or um, going to education and further develop skills in another degree perhaps? It would be nice to have counseling skills available through course work or [Dietitians of Canada], and it could include exercise and nutrition type counseling. Because I think when you are talking to a patient, they don't differentiate between where its nutrition or exercise, you are dealing with the same concepts to get your messages across. So any type of counseling skills that we could develop to strengthen ourselves, um, would help in either area.

Because it is really, I mean it's the skill is, across the board, I mean if you have skill in counseling, that's applicable in, to active living, to nutrition, to all kinds of things, it's the same skill, it's just the depth of our skill. I

mean in my case, I mean I had one person in internship that I considered to be a highly skilled counselor and I was fortunate enough to be able to steal many good ideas from her but I don't know that everybody encounters an individual with that level of skill that you can take from, or that you get enough, and even if you do encounter someone like that, your time is so short that you don't glean everything that you might need or don't get the opportunity to put it into practice and get the feedback on what you might do differently. So I personally feel that my counseling skills are kind of wimpy in some areas or could definitely be improved and I know from talking to other dietitians that they will voice that same concern that we are never really sure if we are there.

So we haven't really had any courses on, this is good counseling, and i.e. what is good counseling? I mean, you have to be, in my opinion, again, my bias, you have to be an active listener, right. But, you know, "how do you teach someone to do that?", that's a good question. But, um, in regards to what do you specifically need in order to counsel someone for active living, you have to know, before you counsel, you have to know how to assess it and so, um, when you are asking them how much do you do, is that enough, like is there a physical, we call it a diet history, is there a physical activity history that you can take and um, and then from there assess it and see where they are at and then make some, you know, some recommendations. So I think before you counsel them you have to know how to assess it. I think maybe that's what we need, how to assess it.

3.3.3 Researchers Interpretations of the Focus Groups

The participant's discussion of physical activity and active living and how it could be incorporated into nutrition counseling was limited to their own perceptions. There was invaluable discussion among each focus group. However, it was worth noting some of the participant's perceptions within the context of active living. In two of the focus groups, a participant requested that the moderator repeat Health Canada's definition of active living provided in the preamble. It appeared they had difficulty comprehending the concept. In part of the discussion, participants were sharing their views based on prescriptive

exercise. Some of the needs they identified did not pertain to active living, but rather prescriptive exercise.

3.4 Discussion

This chapter focused on the perceptions of dietitians to incorporate active living into nutrition counseling. The results supported dietitians adopting a proactive role in promoting active living and increasing their collaboration with exercise professionals. As we were exploring unfamiliar territory, it was inevitable that certain barriers were identified. Dietitians addressed concerns related to their own comfort level based on a lack of education and knowledge in exercise physiology. They also expressed concerns about public and professional perceptions of dietitians counseling on active living, and the relative importance of their commitments to nutrition and to their client's needs.

The overall atmosphere of the focus group interviews was very positive. Most participants were in favor of including active living as part of the dietitian's role. Most agreed that a dietitian would not prescribe exercise; s/he would encourage clients to be more physically active, as part of a "lifestyle strategy" by helping to motivate clients to become physically active. However, they did not see monitoring physical activity as part of the dietitian's role. Instead, they could assist clients to self-monitor. They recognized the importance of combining nutrition and physical activity as a combined message.

There is literature to support dietitians adopting a role in promoting active living. Dietitians of Canada (2001) state that "population health promotion strategies that promote healthy eating and active living help to reduce the incidence of chronic illnesses" (page 2) and that dietitians should "utilize health promotion, disease prevention and treatment strategies that support communities and individuals to make healthy eating and active living choices" (page 11). In a position statement from the American Dietetic Association (1998), it states "optimal nutrition and physical activity can promote health and reduce the risk of chronic disease. Qualified dietetic professionals should play an integral role in health promotion and disease prevention programs" (page 205). These recommendations from dietetic professional governing bodies support the need to promote active living as part of nutrition counseling. There is an understanding of the added benefit of regular physical activity to lowering the risk of chronic disease (ADA, 1998).

Although dietitians are being encouraged to promote active living, it must be put into context with nutrition counseling. Most of a dietitian's time is spent counseling on nutrition and the amount of time devoted to active living may be minimal. Typically, dietitians only have one visit with a client, and most of that time is spent addressing nutrition issues. A dietitian working in an out-patient clinic or in the community may see this new role as a necessity for their clients. For example, those working as diabetes educators see the importance and value that physical activity provides for their clients. However, a dietitian working with

patients in acute care may not see the promotion of active living as a priority at this time.

A dietitian's role to promote active living could be put into context with *Canada's Physical Activity Guide to Healthy Active Living* (Health Canada, 1998) guidelines (Barr, 2001). They should be confident to discuss the guide with their clients and suggest ways to incorporate regular physical activity into their day. In addition, they would be capable of recognizing when a client needs to be referred to a physical activity professional. However, a dietitian would not be capable of prescribing exercise; this would still remain the responsibility of a physical activity professional.

All participants agreed that there needed to be collaboration between dietitians and physical activity professionals. Barr (2001) describes the current relationship between the two professions as a "casual acquaintance" and recognizes the potential for optimizing health by making a "lifelong partnership" between the two. Currently, the two professions are working parallel, but rarely converge (Barr, 2001). Research on nutrition and physical activity in disease prevention demonstrates why dietitians and physical activity professionals should collaborate, but Barr (2001) illustrates how this should come about. It should involve educating dietitians and physical activity professionals about the implications of physical activity and nutrition, respectively. For dietitians, Barr proposes that they should be aware of inactivity and its influence on chronic disease, components of physical fitness, and use *Canada's Physical Activity Guide to Active Living* to make broad guidelines to the public. They should

recognize the limits of their knowledge and refer clients to physical activity professionals, as required.

Participants of the focus groups felt they needed more education and knowledge of physical activity and active living to promote it effectively. The ADA (1998) recommends that "education, practice and research activities should include comprehensive approaches to enhancing individual health behaviors, as well as promoting norms that improve the health of the community, targeting multiple settings and populations, using multiple strategies, and involving participants in prevention efforts" (page 207).

Researchers have shown that continuing education was valuable to increasing knowledge and self-efficacy. A study by Noel and Ames (1989) investigated dietitian's attitudes and knowledge about aging. They concluded that continuing education on aging had a positive influence on dietitians' attitudes and knowledge about the issues of income and health of elderly adults (Noel and Ames, 1989). Eckstrom et al (1999) investigated changing physicians practices related to physical activity by conducting education workshops to improve self-efficacy and counseling behaviors. They concluded that educational interventions were effective in improving self-efficacy for physical activity counseling (Eckstrom et al, 1999).

The focus group participants recognized that increasing their own skills in the area of active living counseling was important in promoting behavior change in their clients. To support this, the ADA (1998) discussed the role of dietitians in health promotion and disease prevention programs and recognized that dietitians

need to further develop their skills in counseling, education, communications and community development. This would include an understanding of the theories and models related to behavior change (ADA, 1998). However, others recognize the diverse skill set of dietitians as effective educators in facilitating behavior change related to food choices and eating behaviors to optimize health. Also, their research skills would allow them to develop a knowledge base that is necessary to effectively incorporate active living into their counseling practices (Dietitians of Canada, 2001).

It was encouraging that many of the participants were already advocates of physical activity. However, there seemed to be some confusion or misinterpretation of the concept of active living. In two of the focus groups, a participant requested that the moderator repeat Health Canada's definition of active living provided in the preamble. Based on the discussions, it appeared that some of the participants did not have a clear understanding of the active living message. A number of the needs identified would not apply to counseling on active living, but rather for prescriptive exercise. Also, when discussing the role of the dietitian, participants made remarks that would suggest it was somewhat unclear to them. For example, some stated that they would not know how to set up an exercise program for their clients if requested. From a physical activity perspective, an exercise program would go beyond active living.

The aim of the focus groups was to identify dietitians' perceptions. The discussion generated was valuable to support the need for the next stage of the research project – an educational workshop. The results helped to direct the

broad topic areas of the workshop to truly reflect the needs of dietitians. However, the content of each topic area remained the responsibility of physical activity professionals.

Dietitians are choosing to use multiple skills in multiple roles to achieve multiple goals. (American Dietetic Association, 1998)

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Chapter Four: Development of a questionnaire to assess dietitians' knowledge, attitudes, and self-efficacy related to promoting active living.

4.1 Introduction

Focus group interviews were conducted to identify the perceived role and needs of dietitians in promoting active living (Chapter 3). The results indicated that participants overwhelmingly agreed that this could be part of a dietitian's role. It was imperative to identity this role before proceeding with the next stage of the research project. Without agreement from dietitians, there would be no need to conduct an educational workshop on active living.

The next stage in the research project was to offer dietitians information, activities for skill development, and resources to increase their self-efficacy in promoting active living. This was accomplished by offering a 2-day educational workshop which was developed based on (1) the results of the focus group interviews and (2) consultation with physical activity professionals. The focus group participants identified areas they felt they were lacking in knowledge and skills to effectively promote active living. Participants from the focus group interviews expressed concern about their confidence to assess and counsel on physical activity. There was fear of "overdoing it" or "not doing enough". Their perception of physical activity was in the context of exercise prescription; not necessarily in the context of active living and the guidelines from *Canada's*

Physical Activity Guide to Healthy Active Living (Health Canada, 1998). However, what they perceived as exercise guidance may not necessarily have been within their scope of practice. The workshop was designed by nutrition and physical activity professionals to reflect the guidelines of *Canada's Physical Activity Guide to Healthy Active Living*, just as physical activity professionals would use *Canada's Food Guide to Healthy Eating* (Health Canada, 1992) in their practice.

The overall purpose of the research project was to increase dietitians' self-efficacy in promoting active living. It was postulated that increasing self-efficacy would enable dietitians to include active living strategies as an adjunct to nutrition counseling. Consequently, promoting active living to clients would have a positive impact on their health. It was hypothesized that this could be accomplished by educating dietitians in the areas of physical activity and active living. It was necessary to develop a questionnaire to assess the effectiveness of the workshop to reflect the research purpose. The questionnaire was designed to measure knowledge, attitudes, and self-efficacy of dietitians in promoting active living.

From the focus groups, participants felt that they did not have adequate knowledge in the areas of active living and physical activity. This was identified as a barrier to effectively promoting active living. Based on these results, one goal of the workshop was to educate dietitians in the areas of active living and physical activity and to assess changes in knowledge after attendance at the workshop as one outcome measure.

A second outcome measure of the workshop was to assess dietitians' attitudes and self-efficacy towards active living and physical activity. Theoretically, attitudes can be predictive of behavior change, according to Ajzen and Fishbein's (1985) theories of Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). However, the workshop was not designed to directly influence attitudes as a predictor of behavior change, as it was anticipated that the potential workshop participants would have a positive attitude towards promoting active living before attending the workshop. The stronger predictor of behavior change for dietitians promoting active living was self-efficacy, according to Bandura's (1986) Social Cognitive Theory (SCT). As a result, the workshop was developed to improve the self-efficacy of dietitians in promoting active living.

The relationship of self-efficacy to behavior change can be explained by the Social Cognitive Theory (Bandura, 1986). SCT emphasizes that beliefs of personal efficacy are the most pervasive predictor of behavior. If an individual does not believe he or she can produce desired outcomes, they will have little incentive to partake in the behavior. Their perceived self-efficacy relates to their ability to organize and execute the steps required to produce the desired outcome (Bandura, 1997) and goes beyond their perception of competency (Bandura, 1986). It is an assessment of their confidence or ability to perform skills while achieving a successful outcome (Bandura, 1986).

This chapter describes the development, pre-testing, validation, and scoring of the Promotion of Active Living Questionnaire (PAL-Q) to assess dietitians' knowledge, attitudes, and self-efficacy in promoting active living. The

PAL-Q was developed to assess changes pre- and one month post-attendance at a 2-day educational workshop designed to increase dietitians' knowledge, skills, and access to resources to comfortably and confidently promote active living. The procedures undertaken and the results of the questionnaire development are presented.

4.2 Questionnaire Development

4.2.1 Introduction

There are various uses for questionnaires in research. They can "provide important information about behaviors, attitudes, beliefs, and characteristics of populations" (Berdie et al, 1986). Rules for the development of questionnaires are unique for each, but general guidelines and suggestions can apply to all. The guidelines utilized for this questionnaire come from the following sources: a reference guide designed for dietitians who wish to use questionnaires in research or practice (Perkin, 1992), the Nova Scotia Nutrition Survey (1992), and the Nova Scotia Heart Health Program (1992). The questionnaire developed for this project was designed to assess knowledge, attitudes, and self-efficacy of dietitians related to promoting active living.

Three steps in the questionnaire development process were employed – conceptualization, design and construction, and pre-testing (Perkin, 1992, 111). There were several things to consider within each of the processes. The

methods (section 4.2.2) describe the considerations and decisions related to questionnaire development.

4.2.2 Methods

Conceptualization

The first stage in questionnaire development is conceptualization. To successfully conceptualize the questionnaire, the research team (2 professors and 1 graduate student) met to review the purpose of the questionnaire and how it would it be used as a tool to measure outcome variables. These factors had to be considered in the context of the research questions and objectives of the overall project. Questionnaire content was considered during the conceptualization process. When applicable, content was systematically placed into content domains (sub-scales of a broader section). This helped to organize and categorize data for the analysis of the research questions.

Design and Construction

Preliminary design and construction of the questionnaire helped to transform the conceptualization stage into something visual. Consideration at this stage included (1) mode of administration, (2) language and readability, (3) design visualization, (4) statement construction, (5) response formats, and (6) statement placement (Perkin, 1992). These factors were considered within the context of the target population being studied; specifically dependent on population variability and size. For example, it would be more efficient to

administer a questionnaire through mail-outs as opposed to interviews for larger study populations. With a population of health professionals, terms and words could be at a reading level appropriate for that specific target group.

Mode of Administration

An initial design consideration was the mode of administration. The options considered included interviewer administered, respondent administered, or computer administrated with interaction with the respondent. Advantages and disadvantages of each option had to be considered (Perkin, 1992, 113). Respondent administered questionnaires compared to interviewer administered are less time consuming to administer and analyze, more cost effective, and they exclude interviewer bias. However, responses in an interview format would be more detailed and comprehensive (Bailey, 1978; Perkin, 1992, 113).

Language and Readability

Language and appropriate reading level were important aspects to consider in the design of the questionnaire. Sensitivity to various language differences and cultural nuances had to be addressed. If the respondents' mother tongue was not the language chosen or if the target population was culturally diverse, then terms and words with various meanings could be misinterpreted. In addition, it was important to consider the target population when deciding the reading level of terms and statements (Frary, 1996; Perkin, 1992, 113).

Design Visualization

Decisions regarding questionnaire length, layout, and visual design were made in the early stages of questionnaire development. Other design considerations that applied to respondent-administered questionnaires included the use of instructions that were clear and concise, avoiding the use of the term "questionnaire" on any part of the questionnaire, appropriate spacing of questions on each page to avoid a crowded appearance, and providing a name and return address on the front of the questionnaire (Perkin, 1992, 113).

Statement Construction

Statement construction is a vital consideration in questionnaire development. It influences the intended meaning of a statement or domain. Factors considered when constructing statements are: relevance of the statement; avoiding statements with more than one meaning; minimizing ambiguity; statement length; avoiding misleading statements; and avoiding double negatives (Bailey, 1978; Nova Scotia Heart Health Program, 1992; Perkin, 1992, 114; Sheatsley, 1983). Statements needed to be clear and concise (Frary, 1996; Perkin, 1992, 114). A database of statements was created and later used in statement selection.

Response Formats

The response format choices for a questionnaire are either open-ended, closed-ended, or both. For open-ended statements, the response format is not

specified, whereas for closed-ended statements, it is specified. Advantages and disadvantages were considered for both formats. Open-ended statements are useful for survey work where the researcher may not be able to anticipate all possible answers. However, responses may be difficult to code and analyze. Closed-ended statements are more efficiently coded and analyzed and responses are generally relevant to the statements posed. However, this can lead respondents to guess at statements or force them to answer them in ways not captured in the categories provided (Bailey, 1978; Frary, 1996; Perkin, 1992, 115).

Statement Placement

Statement placement or ordering began once statements and categories had been formulated. The following suggestions by Perkin (1992) were considered for statement placement: 1) use non-threatening, simple-to-respond-to statements at the beginning of the questionnaire; 2) place sensitive or difficult statements close to the end of the questionnaire; 3) use a logical order for statement sequence; 4) use broad statements within content categories, followed by more specific statements; 5) include transitional phrases or visual distinctions between content sections; 6) do not place important items at the end of the questionnaire; and 7) devise a statement numbering system that is clear.

4.2.3 Results and Discussion

Conceptualization

The development of the PAL-Q was based on (1) focus group interview results that identified dietitians' perceptions towards incorporating active living into nutrition counseling (Chapter 3), and (2) content to be covered in a 2-day training workshop (Appendix 2). The PAL-Q was to be used to assess three concepts – dietitians' knowledge, attitudes, and self-efficacy to promote active living. The following topic areas were covered in the workshop: what is active living; ways to monitor physical activity; components of physical fitness; community resources and programs; transtheorectical model of behavior change; and barriers and adherence to physical activity.

Questionnaire Content Domains

For this section, the content domains were sub-divided into three separate sections – knowledge, attitudes, and self-efficacy. Various statements in the knowledge section were relevant to more than one content domain. The content domains for knowledge statements represented knowledge of the following areas:

1) Physical fitness and health
2) Comprehension of active living
3) Canada's Physical Activity Guide to Healthy Active Living
4) Physical inactivity and health
5) Counseling strategies

6) Monitoring of physical activity.

These domains were chosen to reflect the content of the workshop. Some domains could have been sub-divided further, but due to a small number of statements per content domain, it was believed that the comprehensiveness of the domains would be lost. In the analysis of the questionnaire, the domains could be considered separately to identify content areas of which respondents have more or less knowledge, or to show areas of greatest or least change from baseline.

The content domain for the attitude section included attitudes of dietitians regarding their role in incorporating active living counseling into their nutrition counseling. Multiple content domains were not included in the attitudes section. It was decided that although attitudes are important to help promote active living in nutrition counseling, the purpose of assessing attitudes was to see if there was a shift towards an overall positive attitude.

The content domain for the self-efficacy section addressed the dietitian's confidence or ability to counsel their clients on active living – either by giving information, resources, or guidelines to their clients. Due to the small number of statements, it was decided not to sub-divide this section. The content domain of the self-efficacy section related back to the overall objective of the workshop – to increase the self-efficacy of dietitians to promote active living.

Design and Construction

Mode of Administration, Language and Readability, and Design Visualization.

The mode of administration was respondent-administered. It was chosen for various reasons. The number of respondents to complete the PAL-Q collectively was relatively large; there was potential for groups to be as large as 30 respondents at one time. The time to complete the questionnaire was estimated to be approximately 30 minutes. Therefore, it was not feasible to have questionnaires administered by interviewers. Also, the questions were closed-ended so it was not necessary to get clarification of responses.

All participants were English-speaking, so language was not a concern. Readability was at a level appropriate for dietitians and the clarity or definition of health and medical terms were not included. It was assumed that the terms used in the statements were at a level of understanding of dietitians.

The design visualizations outlined above (section 4.2.2) were included when designing the PAL-Q. For instance, clear and concise instructions were included, the number of statements per page was minimized, and the researchers name and address was clearly identified on the front of the questionnaire. Bright yellow-colored paper was used for the questionnaire jacket to attract interest, and white paper was used for the body to portray a professional document.

Questionnaire length was also important during the design stage. It had to incorporate an adequate amount of information to accurately assess the determinants to be measured; however, completion time had to be considered.

A lengthy questionnaire is burdensome to respondents which may lead to failed responses (Frary, 1996; Perkin, 1992, 118). Also, time restrictions of less than 30 minutes were allotted at the beginning of the workshop. To minimize its length, each statement was reviewed by the research team for its relevance to the research question and those statements ranked as less relevant were eliminated.

Statement Construction

In the final version of the PAL-Q, there were 33 statements on knowledge of active living and physical activity, 26 statements on dietitian's attitudes towards incorporating active living into nutrition counseling, and 13 statements on dietitian's self-efficacy to provide counseling on active living. The statements were developed by the researcher based on information from a graduate level course in physical education, attendance at a course at the Cooper Institute in Dallas Texas titled "Developing Lifestyle Physical Activity Programs", and from resources on physical activity.

Statements were developed based on the content domains outlined above. A database of statements was devised by the researcher. The following criteria were applied to each statement:

1) Conciseness of the statement
2) Preciseness of the statement
3) Clarity and wording of the statement
4) Context of the statement to the overall objective.

Each statement was close-ended to quantify the data. Statements with more than one meaning were avoided. True and false statements were used for the knowledge section, and judgment statements were used for the attitudes and self-efficacy sections. A sample question was given for each section. The researcher and principal investigator met to discuss which statements were appropriate to include in the questionnaire.

Response Formats

Fixed-response formats were used for the PAL-Q. The knowledge section was scored using "True", "False", or "Do Not Know" categories. The category "Do Not Know" was included to ensure respondents did not guess at statements. There were 18 true statements and 15 false statements.

A common fixed-response format is a Likert scale (LoBiondo-Wood & Haber, 1998, 316). A 5-point Likert scale was used to score the attitudes and self-efficacy sections. The following were the scores and their meanings:

1 – Strongly disagree

2 – Disagree

3 – Undecided – neither agree nor disagree

4 – Agree

5 – Strongly agree

An 'undecided' category was included in the response format. It was decided to include this category as an option to those respondents unsure of the statement or if they truly could not make a judgment. However, LoBiondo-Wood

and Haber (1998) indicate that neutral categories can create problems because it is often the most frequent response and it can be difficult to interpret.

The response formats were chosen as a way to quantify the data to show statistically significant differences between values at base-line and one-month post-intervention. The use of fixed-response formats eliminated the need to code responses, minimizing both time and cost of analysis.

Statement Placement

The PAL-Q was divided into three distinct sections. Each section had complete instructions and its intended purpose was explained. A sample statement was provided as a visual aid for the respondents. The statements were in numerical order for each section; restarting at the beginning of a new section. They were placed in random order with broader statements at the beginning.

4.3 Questionnaire Pre-Testing

4.3.1 Introduction

The next stage in the questionnaire process is pre-testing. Developed questionnaires should be pre-tested with individuals typical of the target population. The respondents should record the length of time to complete the questionnaire as well as to evaluate each statement. The questionnaire should

be pre-tested in the same mode of administration as the final product (Frary, 1996; Bailey, 1978).

Pre-testing identifies problems with the design and construction of the questionnaire. Things to be aware of during pre-testing include: large numbers of non-responses, numerous responses with qualifications, and responses improperly interpreted. These clues need to be carefully examined to determine if they are indicative of problem areas. The results are reviewed and any necessary changes to wording, statement order, instructions and questionnaire length are made. If major changes result from the pre-testing, the revised questionnaire should be pre-tested (Perkin, 1992, 116).

4.3.2 Methods

Sheatsley (1983) suggests a range of 12 - 25 people are required for pre-testing. Dietitians were recruited through the University of Alberta, Alberta Milk, and the Grey Nun's Hospital, in Edmonton. Potential participants identified by the researchers were electronically mailed an invitation to participate in the pre-test. Those willing to participate were mailed a cover letter (Appendix 3), questionnaire (Appendix 4), questionnaire evaluation form (Appendix 5), and a stamped, return envelope. By returning the questionnaire and evaluation, consent was implied. Approval for this study was obtained from the Faculty of Agriculture, Forestry and Home Economics Human Ethics Review Committee, University of Alberta.

Each participant was asked to complete the PAL-Q and a questionnaire evaluation form. The questionnaire evaluation form was adapted from one used in the 1992 Nova Scotia Nutrition Survey. The evaluation form was divided into three sections – knowledge, attitudes, and self-efficacy. Evaluators were asked to indicate how many minutes it took to complete the questionnaire. There were 7 categories to choose from; the times ranged from "less than 5 minutes" to "30 minutes", with an "other minutes" category.

The participants were also asked to rank the relevance of each statement to the content domain. The ranking scale was a standard Likert scale of 1-5, with 1-extremely irrelevant, and 5-extremely relevant. They had an option to select 3-neutral.

Participants were asked if any statements were unclear or poorly worded. If they answered yes, they were asked "what was unclear" and "suggestions for rewording". They were also asked the following questions:

1) Have all of the concepts in the content domain been included in these knowledge statements? If no, which concepts need additional statements?
2) Do the statements represent an adequate amount of [knowledge/attitudes/self-efficacy] concepts on active living and physical activity? If no, what's missing?
3) Do the statements include enough information to obtain a valid estimate of the dietitian's [knowledge/attitudes/self-efficacy] in the area of active living and physical activity?

Statistical Analyses

Descriptive statistics were performed on the ranking of each statement evaluated. The information was collected on the questionnaire evaluation form. The data were used to identify statements ranked as irrelevant or extremely irrelevant. These were further discussed by the researchers to determine if they were to remain in the questionnaire. All data were expressed as frequencies and means ± standard deviation. Analyses were performed using SPSS (version 10.0, 2000, SPSS Inc, Chicago, IL).

4.3.3 Results and Discussion

In total, 17 of the 20 (85%) dietitians who agreed to participate completed the pre-testing of the questionnaire within the specified time period. The average time to complete the questionnaire was 14.7±4.1 minutes. Table 4-1 displays statements ranked 1-extremely irrelevant, or 2-irrelevant by at least one respondent and the number of evaluators with either ranking. All other questions had no rankings less than 3-neutral.

Table 4-1. Statements evaluated as either extremely irrelevant or irrelevant.

No. of Evaluators[1]	Knowledge Statements	Attitude Statements	Self-Efficacy Statements
1	4, 11, 25, 29	6, 7, 9, 16, 18, 19[2], 20, 22	2, 9[2]
2	5, 12, 22, 31	4, 14	
3		5, 12, 13, 17	
4	23, 30		
5	13		

[1]Number of evaluators out of 17 who specified the respective statements.
[2]These questions were not included in the final copy of the questionnaire.

Twenty-seven of the 72 (37.5%) statements had a ranking of either 1-extremely irrelevant or 2-irrelevant by at least one respondent. Of the 27 statements with this ranking, 20 of them were ranked by only 1 or 2 respondents. A statement ranked 3-neutral was not considered for review as it was allowed for non-judgment by the respondent. The reason for ranking it neutral was not provided on the evaluation form. The statements identified in Table 4-1 were reviewed by the researchers (n=3) to determine the relevancy of the statements to the content domain and it was decided by the researchers that the statements were relevant to the content of the workshop. Therefore, these statements were not deleted from the PAL-Q. The results were later used while validating the questionnaire.

Problems with the wording and clarity of statements were identified. Each response was reviewed and consideration was given to the suggestion for rewording. If the same statement was consistently flagged as problematic by ≥ 4 evaluators, then it was reworded. Wording of 18 of 72 (25%) statements were identified as problematic and minor changes were made without changing the intended meaning of the statement.

All of the respondents agreed that the concepts in the content domain had been adequately covered and that the statements represented an adequate amount of knowledge/attitudes/self-efficacy concepts on active living and physical activity. Also, they all agreed that the statements covered enough information to obtain a valid estimate of a dietitian's knowledge/attitudes/self-efficacy in the areas of active living and physical activity.

The questionnaire pre-test was valuable to the developmental process. It was important to get feedback from those similar to the population of its intended use. It added another dimension to the questionnaire development. Criticism from the pre-testers was unbiased as they had no invested interest in the research project objectives and outcomes. Wording of 18 of 72 statements were identified as problematic, however, these changes were editorial in nature (i.e. they did not change the intended meaning of the statement). Since no major changes were made to the PAL-Q, there was no need for it to be retested. The results of the pretest were used for validation of the questionnaire (section 4.4).

4.4 Questionnaire Validation

4.4.1 Introduction

The PAL-Q was validated upon completion of the pre-test. The researchers considered face validity – a subtype of content validity (LoBiondo-Wood & Haber, 1998, 332). Face validity is defined as:

> A rudimentary type of validity that verifies basically that the instrument gives the appearance of measuring the concept. It is an intuitive type of validity in which colleagues or subjects are asked to read the instrument and evaluate the content in terms of whether it appears to reflect the concept the researcher intends to measure. (LoBiondo-Wood & Haber, 1998, 332).

Although face validity is not a substitute for other types of validity, such as criterion-related validity (comparison of two instruments), no other questionnaires measuring the constructs identified in this questionnaire were known to the researchers. Since the questionnaire to be developed was specific to dietitians and had to reflect the content of the training workshop, there was no possibility of comparison between questionnaires.

4.4.2 Methods

To capture face validity, the researchers (n=3) considered (1) each statement individually, (2) each content domain and the statements belonging to each, and (3) overall content of the questionnaire in relation to the content of the workshop. When validating each statement, its content, clarity and wording of the statement, and relevance or meaning was considered. In order for a statement to be accepted as valid, all three researchers had to be in agreement.

A question posed to the respondents of the pre-test related to validity. They were asked "Do the statements include enough information to obtain a valid estimate of the dietitian's [knowledge/attitudes/self-efficacy] in the areas of active living and physical activity?" This is another dimension of face validity. It helps to determine the readability and clarity of the questionnaire (LoBiondo-Wood & Haber, 1998, 316).

4.4.3 Results and Discussion

The researchers met and came to agreement on the statements to be included in the final copy of the PAL-Q. After reviewing the questionnaire evaluation form results, it was decided to drop one statement from the attitudes section and one statement from the self-efficacy section. The statement dropped from the attitudes section was "Clients ask for advice on how to be more regularly active." It was decided that the statement was not an attitude statement. The statement dropped from the self-efficacy section was "I feel my clients want me to counsel them on active living." This statement does not pertain to self-efficacy. For the remaining 18 problematic statements identified, a few minor changes were made to the wording and clarity. The remaining questions were unchanged from pre-test to final copy.

The statements for each content domain were assessed. The knowledge section was the only section with multiple content domains and the following is a breakdown of the number of statements within each content domain (Table 4-2):

Table 4-2. Statements within each content domain about active living.

Content Domains	N
Physical fitness and health	14
Comprehension of active living	8
Canada's Physical Activity Guide to Healthy Active Living	8
Physical inactivity and health	6
Counseling strategies	4
Monitoring of physical activity	2

The researchers agreed that the distribution of statements within each content domain was appropriate. There were only 2 statements in the monitoring

content domain. However, monitoring of physical activity was a small component of the workshop content, and from the focus groups, the participants felt that dietitians would not play a significant role in monitoring physical activity with their clients.

The respondents to the pre-test all agreed that the questionnaire included enough information about active living and physical activity to be a valid measure of dietitian's knowledge, attitudes, and self-efficacy.

4.5 Questionnaire Scoring Key

4.5.1 Introduction

A questionnaire is developed as a measurement tool to assist in analyzing research questions or objectives. A careful developmental process is critical for the success of the instrument in assessing a variety of determinants and behaviors, as well as interpretation of the data to reflect the survey goals. Another stage in developing questionnaires is questionnaire scoring. For quantitative data, a scoring key needs to be devised. The objective of the key is to evaluate the content domains and responses.

4.5.2 Methods

A scoring key was created to reflect the correct (knowledge) and/or favorable (attitudes/self-efficacy) responses. It included the overall scoring

scheme for the PAL-Q, ranges of scores within each content domain, and the value assigned to undecided responses.

4.5.3 Results and Discussion

The overall objective of each section of the PAL-Q was to assess changes pre- and post-attendance of the workshop. This was accomplished by scoring the statements within each section and comparing groups pre- and post-attendance at the workshop.

Correct answers for the knowledge section of the PAL-Q are shown in (Table 4-3).

Table 4-3. Answer key for knowledge statements (T-true; F-false) for the questionnaire.

Statement Number	Correct Answer	Statement Number	Correct Answer	Statement Number	Correct Answer
1	T	12	F	23	T
2	T	13	F	24	T
3	T	14	T	25	F
4	T	15	T	26	T
5	F	16	F	27	F
6	T	17	F	28	F
7	F	18	F	29	T
8	F	19	F	30	F
9	F	20	T	31	F
10	T	21	T	32	T
11	T	22	T	33	T

In the knowledge section, the statements were either "true" or "false". If a respondent answered the statement correctly, a value of 1 was assigned and if they answered the statement incorrectly, or answered "Do Not Know", then a value of 0 was assigned. Thus if all answers were correct, the total score was 33.

Further analysis of the knowledge section was performed to reflect its multiple content domains. Table 4-4 shows the statement numbers that belonged to each domain.

Table 4-4. Statement numbers belonging to each content domain about active living.

Statement Nos. for Each Content Domain (CD)					
CD1[a]	CD2[b]	CD3[c]	CD4[d]	CD5[e]	CD6[f]
1	1	12	3	22	10
2	2	13	14	25	19
3	6		15	30	20
4	7		16	31	32
5	8		17		33
11	9		18		
19	11		19		
23	25		20		
			24		
			26		
			27		
			28		
			32		
			33		

a. Comprehension of active living.
b. Canada's Physical Activity Guide to Healthy Active Living.
c. Monitoring of physical activity.
d. Physical fitness and health.
e. Counseling strategies.
f. Physical inactivity and health.

Statistical analyses can be performed on each content domain to determine if strengths or weaknesses exist within a dietitian's knowledge base of active living.

The judgments for each statement in the attitudes section which represents a favorable response (i.e. more positive attitude) are shown in Table 4-5.

Table 4-5. Answer key for attitudes statements (W-willing; NW-non-willing) for the questionnaire.

Statement Number	Correct Answer	Statement Number	Correct Answer	Statement Number	Correct Answer
1	W	10	W	19	NW
2	W	11	NW	20	NW
3	W	12	W	21	NW
4	NW	13	W	22	NW
5	W	14	NW	23	NW
6	W	15	NW	24	W
7	NW	16	NW	25	W
8	W	17	W	26	W
9	NW	18	W		

In the attitudes section, statements were judged as either "attitudes reflecting a willingness to promote active living" or "attitudes that do not reflect a willingness to promote active living". A 5-point Likert-type scale was assigned to each statement. If the person had a "willingness" to promote active living, then a value range of 1 – 5 was assigned according to the Likert-type scale. For instance, if a statement indicated a "willingness" to promote active living, and a respondent circled 4-agree, then a value of 4 would be assigned to the statement. Alternatively, if a statement indicated a "non-willingness" to promote active living, responses were reversed scored. If a 3 was circled meaning undecided, then answers were assigned no value. Thus a possible maximum score for the attitudes section was 130.

The judgments for each statement in the self-efficacy section which represent a favorable response (i.e. greater self-efficacy) are shown in Table 4-6.

Table 4-6. Answer key for self-efficacy statements (W-willing; NW-non-willing)

Statement Number	Correct Answer	Statement Number	Correct Answer	Statement Number	Correct Answer
1	W	6	W	11	W
2	W	7	W	12	W
3	W	8	W	13	W
4	W	9	NW		
5	W	10	W		

In the self-efficacy section, statements were judged as "the dietitian's confidence or ability (willingness) to counsel their clients on active living – either by giving information, resources, or guidelines to their clients." The same scoring system that was used in the attitudes section applied here. A possible maximum score for the self-efficacy section was 65.

4.6 Summary

The PAL-Q was developed to assess whether changes occurred in dietitians' knowledge, attitudes, and self-efficacy to promote active living pre- and one month post-attendance at an educational workshop. There was a systematic approach to developing it and careful attention was given to each step.

Ideally, a questionnaire should be validated to ensure that it is a fair and accurate measure of the subject being tested. Normally content or construct validity is the best indicator of validity. To determine content of construct validity, the developed questionnaire is compared with other questionnaires or constructs that measure the subject matter. It would be analyzed statistically, and an alpha-coefficient would indicate the validity of the instrument. However, face validity

was employed to validate this questionnaire. There were no other tools or instruments developed that could be used for comparison. Furthermore, the questionnaire was designed specifically to evaluate an educational workshop that was unique to dietitians.

Dietitian's knowledge and attitudes are important to assess, but how they affect self-efficacy and behavior change is the critical question for this research project. The questionnaire was one part of a larger objective, to assess the effect of dietitian's counseling behaviors related to active living on client behavior change.

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Chapter Five: Conclusion and Future Research

5.1 Conclusion

Healthy eating and active living are cornerstones to a healthy lifestyle. Together, they are important in the prevention and treatment of chronic diseases, such as CVD, obesity, and type 2 diabetes by reducing the risk factors associated with these illnesses (American Dietetic Association, 1998; Blair, et al., 1996; Frankish, Milligan & Reid, 1998; Grimm, 1999; Hill, 1999; and Wei, Schwertner & Blair, 2000). Health professionals, including dietitians, are recognizing the need to promote healthy eating and active living and these messages have been promoted in two separate position statements. A statement from the Dietitians of Canada (2001) proposed that "population health promotion strategies that promote healthy eating and active living help reduce the incidence of chronic illnesses" (page 11). The American Dietetic Association (1998) recognized that "optimal nutrition and physical activity can promote health and reduce the risk of chronic disease" (page 205).

This research project highlights the importance of physical activity in the prevention and treatment of chronic disease. Healthy eating and active living are important health promotion strategies to use together to strive for optimal health for all Canadians. This thesis has demonstrated that there is support among dietitians to promote active living and that they are in an ideal position to incorporate active living into nutrition counseling. The focus groups identified

that dietitians should be proactive in promoting active living. However, they recognized that to be effective in promoting active living, they needed additional education, resources, and skill development to successfully incorporate active living into nutrition counseling. The participants felt that they lacked knowledge in exercise science to comfortably and confidently promote active living. To assist dietitians in promoting active living, an educational workshop was designed by nutrition and physical activity professionals. The objectives of the workshop were to increase dietitians' knowledge, and promote positive attitudes and self-efficacy towards active living.

A questionnaire was developed, pre-tested, and validated to evaluate the workshop by assessing dietitians' knowledge, attitudes, and self-efficacy. The content of the questionnaire was based on the results of the focus groups as well as the content presented in the workshop.

The results and discussion from the focus group interviews described in this thesis was the first stage of a larger research project. The next stage was to conduct educational workshops for dietitians. The workshops were conducted in four cities throughout Alberta – Edmonton, Calgary, Grande Prairie, and Medicine Hat. Initial feedback from the participants was very positive. Analysis of the questionnaires will be presented separately.

Based on the results of this research, a longer term vision would be to enhance university training in nutrition with courses about physical activity and health. This could be achieved by allowing nutrition students to have greater

access to physical education courses and by encouraging nutrition students to take physical education courses as electives in their degree program.

5.2 Future Research

This research project has demonstrated the need to combine healthy eating and active living messages in achieving optimal health. Future research initiatives in combining nutrition and active living need to be pursued.

- It is important to investigate the effectiveness of the workshop in increasing dietitians' self-efficacy in promoting active living and whether this leads to behavior change of the dietitian in promoting active living with their clients. It would be of interest to determine what messages are being promoted to the public, including information on physical activity and the types of resources used. Also, it would be important to identify any partnerships that have been formed or attempted between dietitians and physical activity professionals.

- Once dietitians are counseling clients on active living, the next stage is to determine the impact on client health. The first area to assess would be client behavior and their readiness to incorporate active living as a lifestyle behavior. Other measures to assess should be risk factors for disease, including physiological parameters such as blood pressure and serum

lipids, as well as psychological parameters of mental and social well-being. Clinical populations could also be assessed including people with diabetes, cardiovascular disease, and obesity.

- The active living workshop could be adapted for other health professionals such as physicians, nurses, and community health leaders to convey the messages of healthy eating and active living to the public in a comprehensive and consistent manner.

- In order for all health professionals to deliver the messages of healthy eating and active living, a similar study could be designed to assess physical activity professional's role and needs in promoting healthy eating and develop a workshop designed to increase their knowledge and skills in promoting healthy eating.

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Appendix 1:

Demographic information sheet completed by each focus group participant

Let's Get Active!

Active Living Recommendations as Part of Nutrition Counseling

Participant Information

Please answer the following:

March 21, 2001
Participant No. _____

Female _____ Male _____

Are you a Registered Dietitian?

Yes _____ No _____

If yes, how many years have you been practising as a dietitian? _____

What is your current job title: _____

♦ ♦ ♦ ♦ ♦

Where do most of your clients live? Urban _____ Rural _____

What age group(s) do you counsel most often? ***(Check all that apply)***

(<20 years of age) _____

(20-39 years of age) _____

(40-59 years of age) _____

(>60 years of age) _____

♦ ♦ ♦ ♦ ♦

Do you currently counsel client(s) (individuals or groups) about physical activity?

Yes _____ No _____

If yes, how long? (0-6 months) _____

(6 –24 months) _____

(2-5 years) _____

(>5 years) _____

Appendix 2:

Agenda of the 2-day educational workshop titled:

Active Living for You and Your Clients: A Workshop for Dietitians

Active Living For You and Your Clients
A Workshop for Dietitians

DAY 1 - *Itinerary*

Section A - What is Active Living?

8:30 - 9:00	Administration of consent forms and questionnaire
9:00 - 9:15	Introduction, Welcome and Purpose of the Project
9:15 – 10:15	"What is Active Living?" • Risk profiles of Canadians • Physical inactivity and the health related implications • Active living vs. physical fitness • Canada's Physical Activity Guide
10:15 – 10:30	**BREAK**
10:30 - 11:15	"The Dietitian's Role in Promoting/Counseling Active Living" Discussion on scope, role, guidelines, limits and concerns
11:15 - 12:15	"Ways to Monitor Physical Activity" • Direct and indirect methods of assessing physical activity
12:15 - 1:15	**LUNCH**

Section B - "Walk the Talk"

1:15 - 2:15	"Components of Physical Fitness" • Performance related & health related fitness • Benefits of fitness
2:15 - 2:45	"Misconceptions Around Physical Activity" • Association of fitness and disease outcomes • Special consideration / risk factors
2:45 - 3:00	**BREAK**
3:00 - 4:30	"Be Fit For Life Network" • Community Support to Promote an Active Lifestyle • What is available in the community - programs and organizations already present that promote active lifestyles.
4:30	Wrap-up of day 1

Active Living For You and Your Clients
A Workshop for Dietitians

INSTITUT DANONE
DANONE INSTITUTE
CANADA

DAY 2 - *Itinerary*

Section C - Counseling Skills: Ready... Set... Go!

8:30 - 10:00	"Counseling Clients Towards Active Living: Through the Stages of Change" • *Stages of Change* Model • Assessing readiness
10:00 - 10:15	**BREAK**
10:15 - 11:30	"Barriers and Adherence to Being Physically Active" • Identification • Strategies to overcome them • Alternatives to barriers
11:30 - 12:30	**LUNCH**

Section D - Change the Stage

12:30 - 1:30	Group Work - "Stages of Change" Activity • Determining stages of change based on client statements
1:30 - 3:00	Group Work - "Profiles" Activity • Stages of change and processes • Practicing counseling strategies
3:00 – 3:30	Workshop wrap-up and review

Appendix 3:

Cover letter to participants pre-testing the questionnaire

January, 2002

Re: Active Living Questionnaire Pre-Testing

I would like to thank you for volunteering to pre-test the following questionnaire. After you have completed the questionnaire, please complete the attached evaluation, including the length of time you spent on the questionnaire. Please return the evaluation with the questionnaire in the envelope provided.

By completing the questionnaire, it is implied you have consented to participate in the pre-testing of the questionnaire.

Your willingness to help is greatly appreciated.

Sincerely,

Linda McCargar PhD, RD
Professor, Department of Agricultural, Food & Nutritional Science
University of Alberta

Appendix 4:

Questionnaire assessing knowledge, attitudes, and self-efficacy of dietitians in promoting active living

SECTION 1: KNOWLEDGE OF ACTIVE LIVING AND PHYSICAL ACTIVITY
The following section contains statements related to active living and physical activity. Please circle the number that best indicates your knowledge of the statement. If you are unsure of the answer, do not guess and please mark **DO NOT KNOW**.

1 – This statement is **TRUE**
2 – This statement is **FALSE**
3 – I **DO NOT KNOW** whether this statement is True or False

---

SAMPLE: Red meat is a good source of iron. 1 2 3

This person believes this statement is **TRUE**.

	TRUE	FALSE	DO NOT KNOW
1. Everyone can adopt an active lifestyle.	1	2	3
2. By definition, active living is valued and integrated into daily life.	1	2	3
3. There are psychological and social benefits of active living for individuals.	1	2	3
4. Active living is not only low intensity activities.	1	2	3
5. Athletes should not be counseled on active living.	1	2	3
6. Canada's Physical Activity Guide recommends stretching activities 4-7 days per week.	1	2	3
7. Canada's Physical Activity Guide recommends strength training 4-7 days per week.	1	2	3
8. Canada's Physical Activity Guide recommends endurance activities 3-4 days per week.	1	2	3

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

	TRUE	FALSE	DO NOT KNOW
9. Canada's Physical Activity Guide is not adequate to properly counsel clients on active living.	1	2	3
10. There is a "Physical Activity Guide for Older Adults".	1	2	3
11. Physical inactivity is an independent risk factor for cardiovascular disease.	1	2	3
12. Activities should last for a minimum of 20 minutes at a time to see health benefits.	1	2	3
13. A person who walks at least 2000 steps a day is considered active.	1	2	3
14. Pedometers are one tool used to monitor physical activity.	1	2	3
15. Body composition is one health-related component of physical fitness.	1	2	3
16. A person with excess body fat cannot be physically fit.	1	2	3
17. Strength training always leads to large muscles.	1	2	3
18. Older adults should not engage in strength training activities due to fear of injury.	1	2	3
19. Children should not engage in strength training activities because it will lead to developmental problems.	1	2	3
20. Individuals who are active as children are more likely to be active as adults.	1	2	3

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

	TRUE	FALSE	DO NOT KNOW
21. Exercise is a better long-term weight management strategy than restricting caloric intake.	1	2	3
22. The stages of change model is a useful tool in counseling clients on active living.	1	2	3
23. The Be Fit For Life Network has eight centers throughout Alberta.	1	2	3
24. Cardiorespiratory endurance improves heart health.	1	2	3
25. Dancing is considered a light effort activity in Canada's Physical Activity Guide.	1	2	3
26. Strength training increases or maintains bone density.	1	2	3
27. Individuals who are at risk of a heart attack should not be physically active.	1	2	3
28. Individuals with osteoporosis should avoid strength training activities.	1	2	3
29. Time is the number one barrier for individuals to be physically active.	1	2	3
30. According to the stages of change model, a person must be active for at least 4 months to be considered in the maintenance stage.	1	2	3

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

	TRUE	FALSE	DO NOT KNOW
31. A person in the contemplation stage has never thought of being active.	1	2	3
32. Physical unfitness is a greater risk factor for cardiovascular disease than smoking.	1	2	3
33. Increasing physical fitness is more beneficial than decreasing blood pressure or cholesterol in reducing the risk of cardiovascular disease.	1	2	3

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

SECTION 2: ATTITUDES TOWARDS ACTIVE LIVING AND PHYSICAL ACTIVITY
The following section contains statements related to your attitudes towards active living and physical activity. Read each statement and rank the statement from 1 to 5.

1 – If you **STRONGLY DISAGREE** with the statement
2 – If you **DIDAGREE** with the statement
3 – If you are **UNDECIDED**, neither agree nor disagree with the statement
4 – If you **AGREE** with the statement
5 – If you **STRONGLY AGREE** with the statement

SAMPLE: The Edmonton Oilers are the best team in the NHL. 1 2 3 4 5

This person is **UNDECIDED** about this statement.

	Please circle most appropriate score				
	SD	**D**	**U**	**A**	**SA**
1. As a dietitian, I want to incorporate active living counseling into my practice.	1	2	3	4	5
2. As a dietitian, I will monitor physical activity with my clients.	1	2	3	4	5
3. As a dietitian, I have enough time to provide counseling on active living.	1	2	3	4	5
4. Active living is 'the same old concept with a new name'.	1	2	3	4	5
5. I feel my supervisor sees active living as a priority for dietitians.	1	2	3	4	5
6. It is a dietitian's role to be counseling clients on active living.	1	2	3	4	5
7. Active living should be the sole responsibility of the physical activity professionals.	1	2	3	4	5

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

	SD	D	U	A	SA
8. Dietitians should have more collaboration with physical activity professionals.	1	2	3	4	5
9. Dietitians would be 'stepping on the toes' of physical activity professionals if they provide counseling on active living.	1	2	3	4	5
10. Promoting active living is valuable to my clients.	1	2	3	4	5
11. As a dietitian, I am concerned with any legal implications of improperly counseling my clients on active living.	1	2	3	4	5
12. The recommendations in Canada's Physical Activity Guide are adequate for all Canadians.	1	2	3	4	5
13. I feel that the public would want dietitians counseling on active living.	1	2	3	4	5
14. There are too many personal fitness leader designations to keep track of for referral purposes.	1	2	3	4	5
15. In order to properly counsel clients on active living, dietitians need to have extensive knowledge in exercise physiology.	1	2	3	4	5
16. I feel dietitians need more counseling skills to effectively counsel on active living.	1	2	3	4	5
17. Clients adhere well to nutrition recommendations.	1	2	3	4	5
18. Clients will adhere well to active living recommendations.	1	2	3	4	5

	SD	D	U	A	SA
19. Individuals need more than active living in order to receive health benefits.	1	2	3	4	5
20. It is too difficult for inactive individuals to become active.	1	2	3	4	5
21. Dietitians have very little follow up with clients which would make it difficult to effectively counsel on active living.	1	2	3	4	5
22. It is easier for individuals to alter their dietary habits than to alter their physical activity habits.	1	2	3	4	5
23. My workload will increase if I begin to counsel my clients on active living.	1	2	3	4	5
24. It is important for individuals to be physically active daily.	1	2	3	4	5
25. My clients would benefit from being physically active.	1	2	3	4	5
26. As a dietitian, I consider myself a 'lifestyle coach'.	1	2	3	4	5

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

SECTION 3: CONFIDENCE AND ABILITIES TO PROVIDE COUNSELING ON ACTIVE LIVING AND PHYSICAL ACTIVITY AS A DIETITIAN

The following section contains statements related to your confidence and abilities as a dietitian to counsel your clients on active living and physical activity. Read each statement and rank the statement from 1 to 5.

1 – If you **STRONGLY DISAGREE** with the statement
2 – If you **DISAGREE** with the statement
3 – If you are **UNDECIDED**, neither agree nor disagree with the statement
4 – If you **AGREE** with the statement
5 – If you **STRONGLY AGREE** with the statement

SAMPLE: I feel I play the piano well. 1 2 3 4 5

This person **DISAGREES** with this statement.

	Please circle most appropriate score SD	D	U	A	SA
1. I feel I have enough knowledge to counsel my clients on active living.	1	2	3	4	5
2. As a dietitian, I feel I have skills to counsel on active living.	1	2	3	4	5
3. I feel I can access good active living resources for my clients.	1	2	3	4	5
4. I feel I know enough about fitness professionals and their qualifications to refer my clients to one.	1	2	3	4	5
5. I feel I know what questions I should ask my clients about their physical activity patterns.	1	2	3	4	5
6. I feel I know enough types of activities to make good suggestions to my clients.	1	2	3	4	5

ACTIVE LIVING RECOMMENDATIONS AS PART OF NUTRITIONAL COUNSELING

	SD	D	U	A	SA
7. I feel I know what role I should play in providing advice about active living.	1	2	3	4	5
8. I feel confident that I know what constitutes active living.	1	2	3	4	5
9. I need more courses on active living and physical activity to be confident in counseling my clients on active living.	1	2	3	4	5
10. I know enough about the relationship between physical activity and disease states to counsel my clients on active living.	1	2	3	4	5
11. I know when a client needs to be referred to a fitness professional.	1	2	3	4	5
12. I can help my clients set realistic physical activity goals based on Canada's Physical Activity Guide.	1	2	3	4	5
13. I already counsel clients on active living.	1	2	3	4	5

Appendix 5:

Questionnaire Evaluation Form for pre-testing the questionnaire

QUESTIONNAIRE EVALUATION FORM

KNOWLEDGE SECTION

Please answer the questions below after completing the Active Living Questionnaire. Your responses are very important in ensuring that the questionnaire provides a valid representation of dietitians' knowledge, attitudes and self-efficacy about active living.

The CONTENT DOMAIN for the knowledge statements is to cover knowledge of the following areas: (1) comprehension of active living; (2) Canada's Physical Activity Guide; (3) monitoring of physical activity; (4) physical fitness and health; (5) counseling strategies; and (6) physical inactivity and health.

1. Approximately how long did it take you to complete the questionnaire? (Please check one)

_____less than 5 minutes

_____10 minutes

_____15 minutes

_____20 minutes

_____25 minutes

_____30 minutes

_____Other (please indicate) _____minutes

2. Indicate whether or not you judge the following knowledge statements to be relevant (representing the CONTENT DOMAIN), by circling a number from 1-5.

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5
11	1	2	3	4	5
12	1	2	3	4	5
13	1	2	3	4	5
14	1	2	3	4	5
15	1	2	3	4	5
16	1	2	3	4	5
17	1	2	3	4	5
18	1	2	3	4	5
19	1	2	3	4	5
20	1	2	3	4	5
21	1	2	3	4	5
22	1	2	3	4	5
23	1	2	3	4	5
24	1	2	3	4	5
25	1	2	3	4	5
26	1	2	3	4	5

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
27	1	2	3	4	5
28	1	2	3	4	5
29	1	2	3	4	5
30	1	2	3	4	5
31	1	2	3	4	5
32	1	2	3	4	5
33	1	2	3	4	5

3. Did you find any of the questions unclear or poorly worded? (Please circle)

YES **NO**

If you circled **YES,** please use the following space to indicate the Questionnaire (either A, B, or C) and Question Number (i.e. A1) of each question that was unclear or poorly worded. If possible, please describe what was unclear and/or suggestions for rewording. If there is not enough space on the attached sheets, please attach another sheet and clearly identify the question#. Thank-you.

1. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

2. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

3. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

4. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

5. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

6. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

7. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

4. Have all of the concepts in the CONTENT DOMAIN been covered in these knowledge statements?
YES_____
NO _____
If no, which concepts need additional statements?

5. Do the statements represent an adequate amount of concepts on active living and physical activity?
YES_____
NO _____
If no, what is missing?

Do the statements cover enough information to obtain a valid estimate of the dietitians knowledge in the area of active living and physical activity?
YES_____
NO _____

If you have any additional comments to make, please do so.

Thank-you for filling out our questionnaires and for the feedback you gave. Your willingness to help is greatly appreciated.

QUESTIONNAIRE EVALUATION FORM

ATTITUDES SECTION

Please answer the questions below after completing the Active Living Questionnaire. Your responses are very important in ensuring that the questionnaire provides a valid representation of dietitians' knowledge, attitudes and self-efficacy about active living.

The CONTENT DOMAIN for the attitudes statements is to cover <u>attitudes of dietitians as part of their role in incorporating active living counseling into their nutrition counseling.</u>

1. Indicate whether or not you judge the following knowledge statements to be relevant (representing the CONTENT DOMAIN), by circling a number from 1-5.

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
11	1	2	3	4	5
12	1	2	3	4	5
13	1	2	3	4	5
14	1	2	3	4	5
15	1	2	3	4	5
16	1	2	3	4	5
17	1	2	3	4	5
18	1	2	3	4	5
19	1	2	3	4	5
20	1	2	3	4	5
21	1	2	3	4	5
22	1	2	3	4	5
23	1	2	3	4	5
24	1	2	3	4	5
25	1	2	3	4	5
26	1	2	3	4	5
27	1	2	3	4	5

2. Did you find any of the questions unclear or poorly worded?
(Please circle)

YES **NO**

If you circled **YES,** please use the following space to indicate the Questionnaire (either A, B, or C) and Question Number (i.e. A1) of each question that was unclear or poorly

worded. If possible, please describe what was unclear and/or suggestions for rewording. If there is not enough space on the attached sheets, please attach another sheet and clearly identify the question#. Thank-you.

1. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

2. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

3. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

4. Question #_____

What was unclear?

Suggestions for rewording?

5. Question #_____

What was unclear?

Suggestions for rewording?

6. Question #_____

What was unclear?

Suggestions for rewording?

7. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

3. Have all of the concepts in the CONTENT DOMAIN been covered in these attitude statements?
YES_____
NO _____
If no, which concepts need additional statements?

4. Do the statements represent an adequate amount of concepts on attitudes of dietitians in providing counseling on active living?
YES_____
NO _____
If no, what is missing?

Do the statements cover enough information to obtain a valid estimate of the dietitian's attitudes in providing counseling on active living?
YES_____
NO _____

If you have any additional comments to make, please do so.

Thank-you for filling out our questionnaires and for the feedback you gave. Your willingness to help is greatly appreciated.

QUESTIONNAIRE EVALUATION FORM

SELF-EFFICACY SECTION

Please answer the questions below after completing the Active Living Questionnaire. Your responses are very important in ensuring that the questionnaire provides a valid representation of dietitians' knowledge, attitudes and self-efficacy about active living.

The CONTENT DOMAIN for the self-efficacy statements is to cover <u>the dietitian's confidence or ability to counsel their clients on active living – either by giving information, resources or guidelines to their clients.</u>

1. Indicate whether or not you judge the following knowledge statements to be relevant (representing the CONTENT DOMAIN), by circling a number from 1-5.

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5

Statement Number	Extremely Irrelevant		Neutral		Extremely Relevant
11	1	2	3	4	5
12	1	2	3	4	5
13	1	2	3	4	5
14	1	2	3	4	5

2. Did you find any of the questions unclear or poorly worded? (Please circle)

YES **NO**

If you circled **YES,** please use the following space to indicate the Questionnaire (either A, B, or C) and Question Number (i.e. A1) of each question that was unclear or poorly worded. If possible, please describe what was unclear and/or suggestions for rewording. If there is not enough space on the attached sheets, please attach another sheet and clearly identify the question#. Thank-you.

1. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

2. Question #_____

What was unclear?

Suggestions for rewording?

3. Question #_____

What was unclear?

Suggestions for rewording?

4. Question #_____

What was unclear?

Suggestions for rewording?

5. Question #_____

What was unclear?

_____

Suggestions for rewording?

_____

_____

6. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

_____

7. Question #_____

What was unclear?

_____

_____

Suggestions for rewording?

_____

3. Have all of the concepts in the CONTENT DOMAIN been covered in these self-efficacy statements?
YES_____
NO _____
If no, which concepts need additional statements?

4. Do the statements represent an adequate amount of concepts on self-efficacy of dietitians in providing counseling on active living?
YES_____
NO _____
If no, what is missing?

Do the statements cover enough information to obtain a valid estimate of the dietitian's self-efficacy in providing counseling on active living?
YES_____
NO _____

If you have any additional comments to make, please do so.

Thank-you for filling out our questionnaires and for the feedback you gave. Your willingness to help is greatly appreciated.